

FIG.1

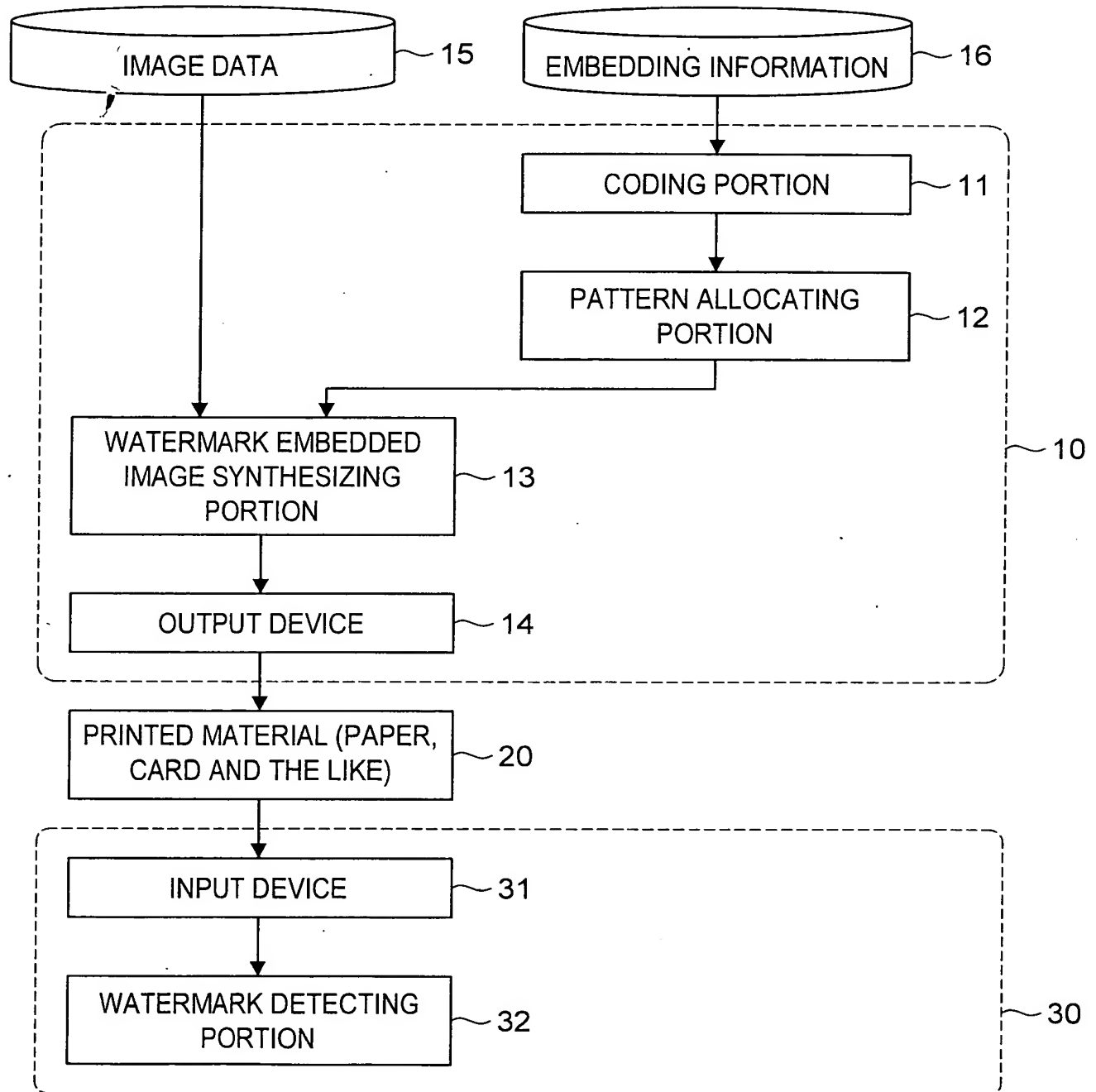


FIG.2

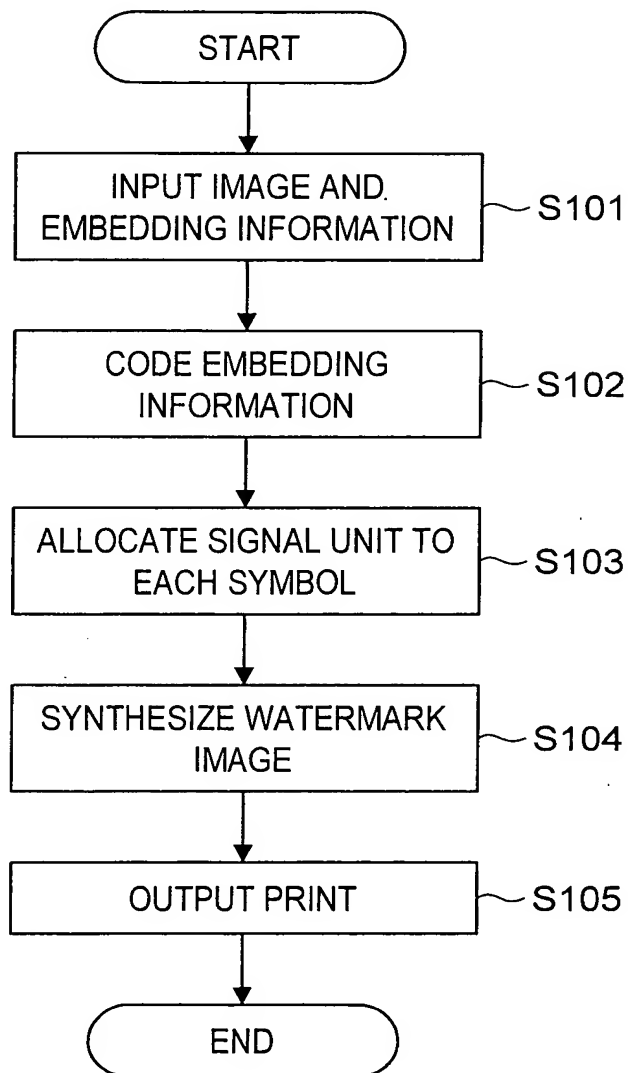
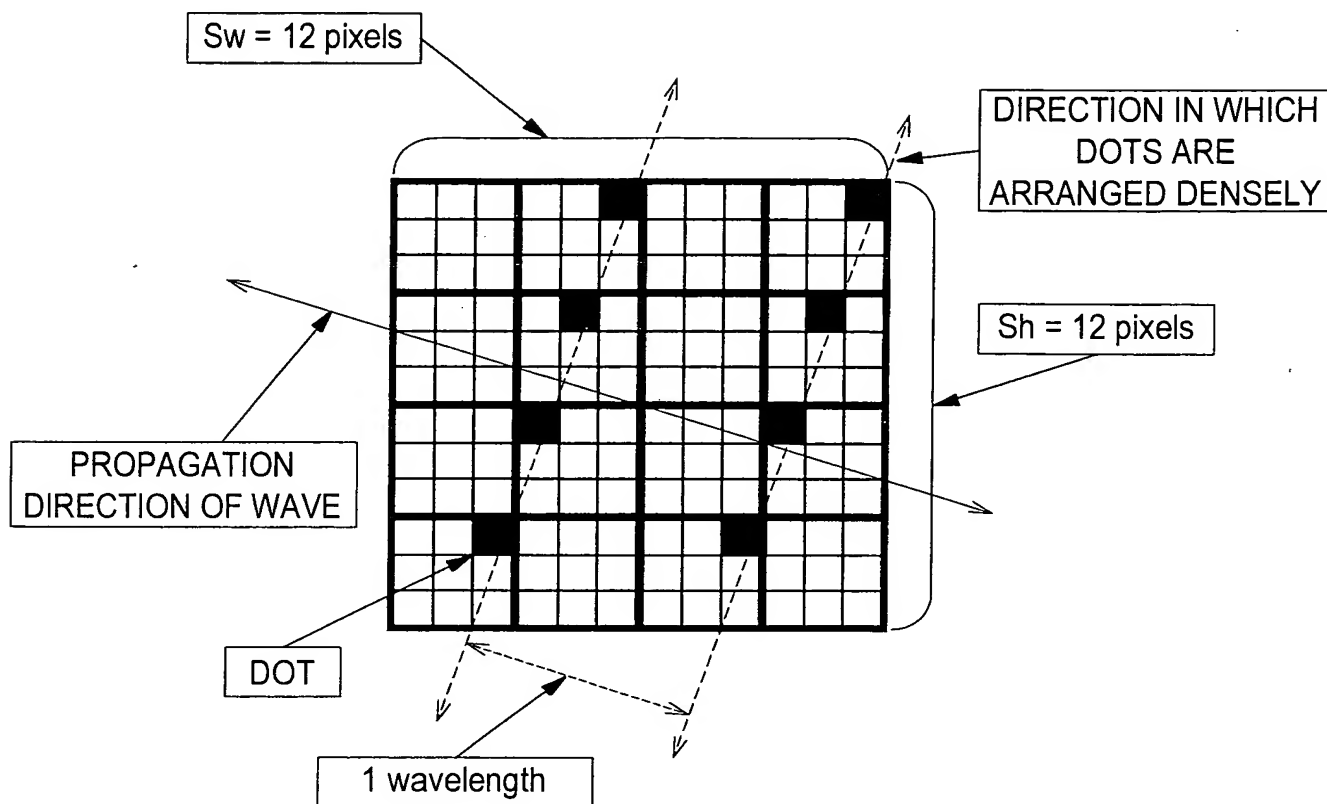
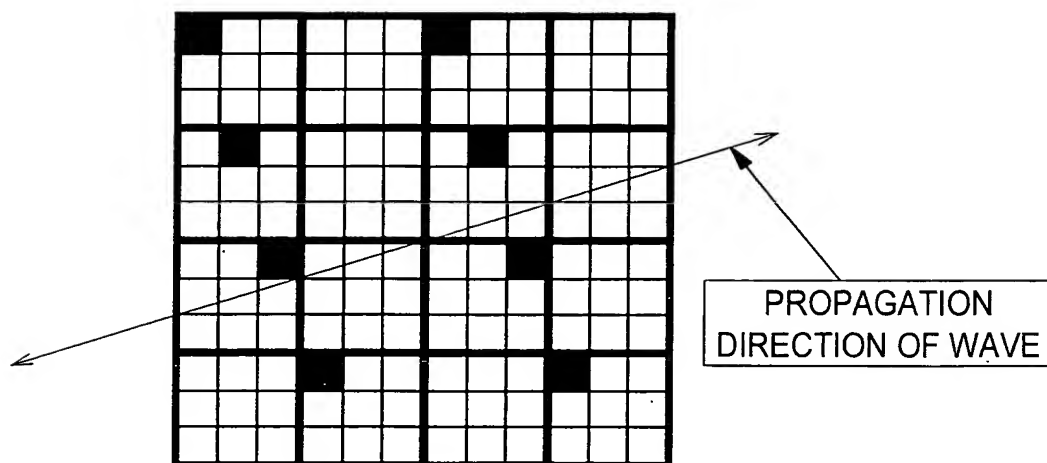


FIG.3

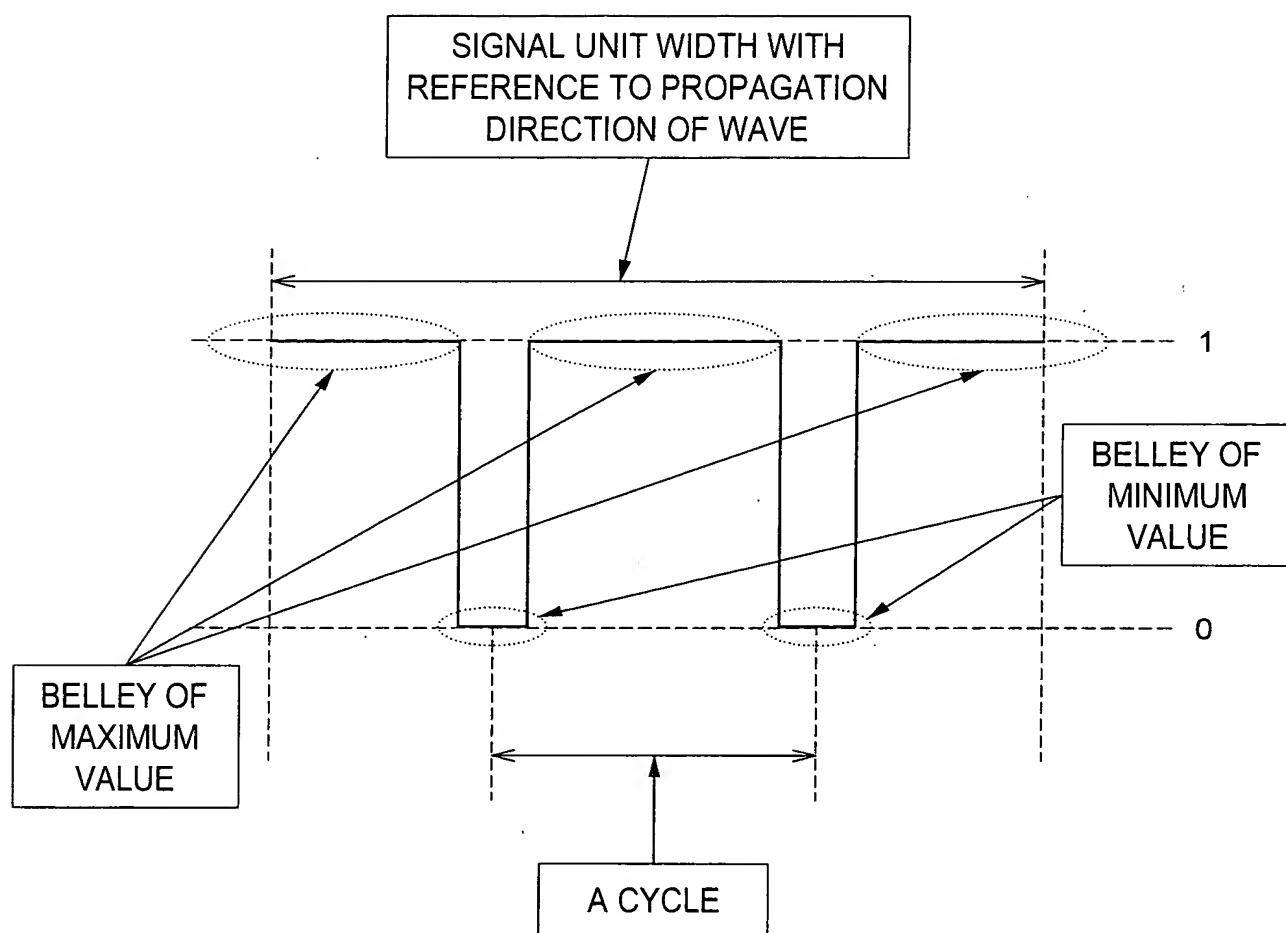


(1) UNIT A



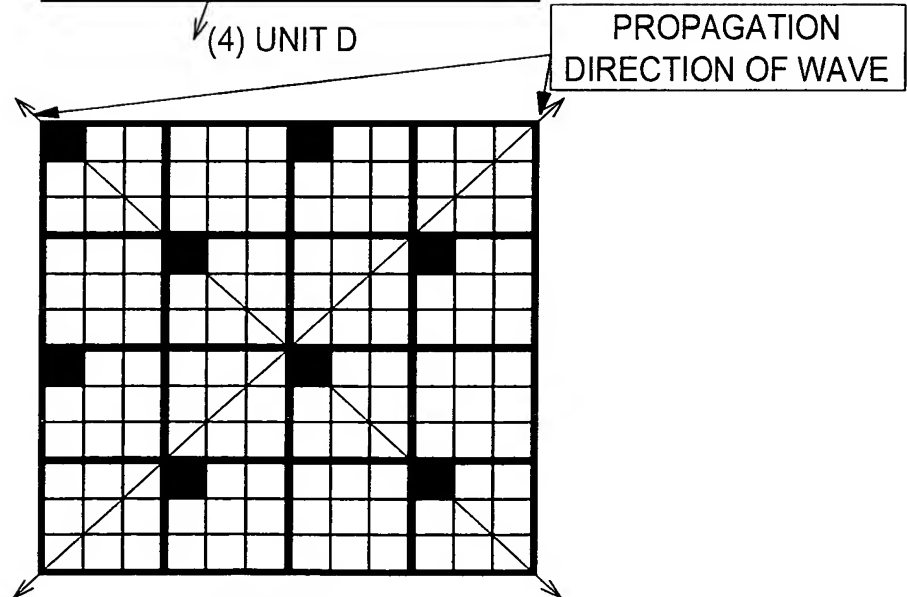
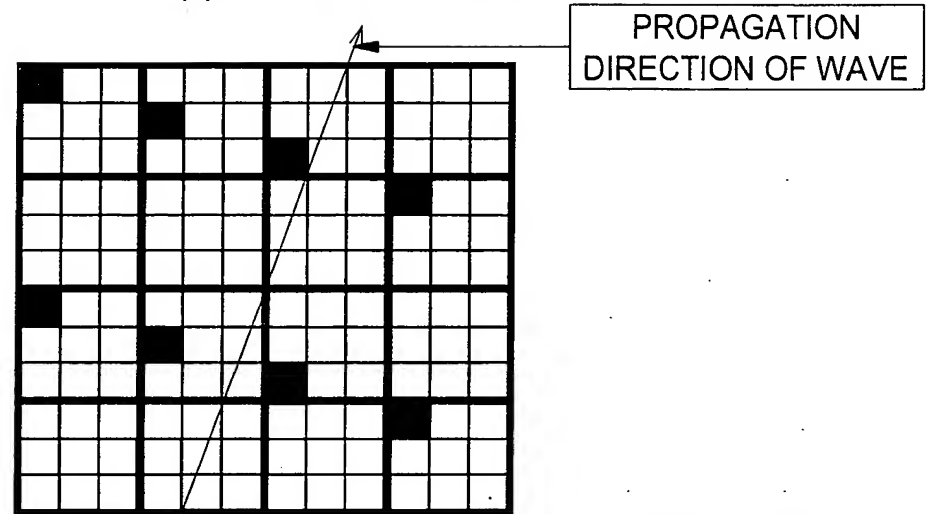
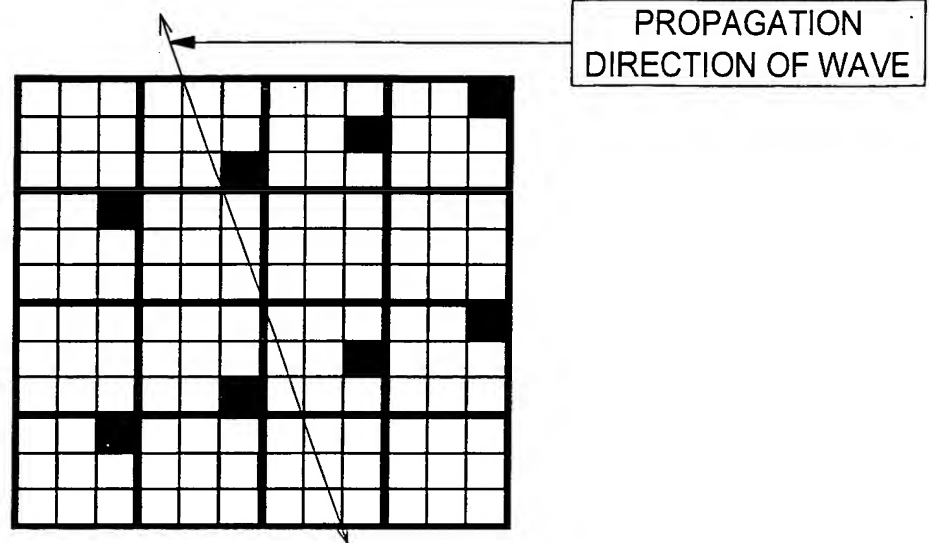
(2) UNIT B

FIG.4



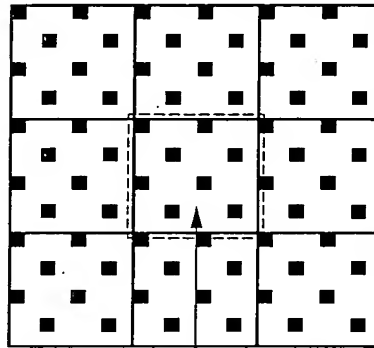
5/36

FIG.5



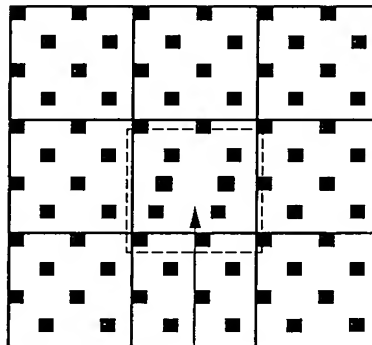
6/36

FIG.6



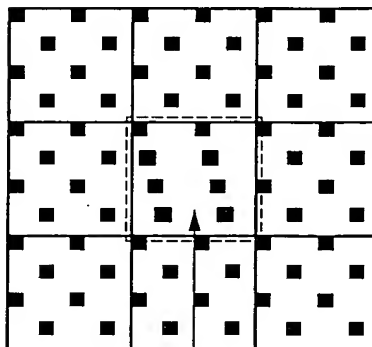
UNIT E

(1)



UNIT A

(2)

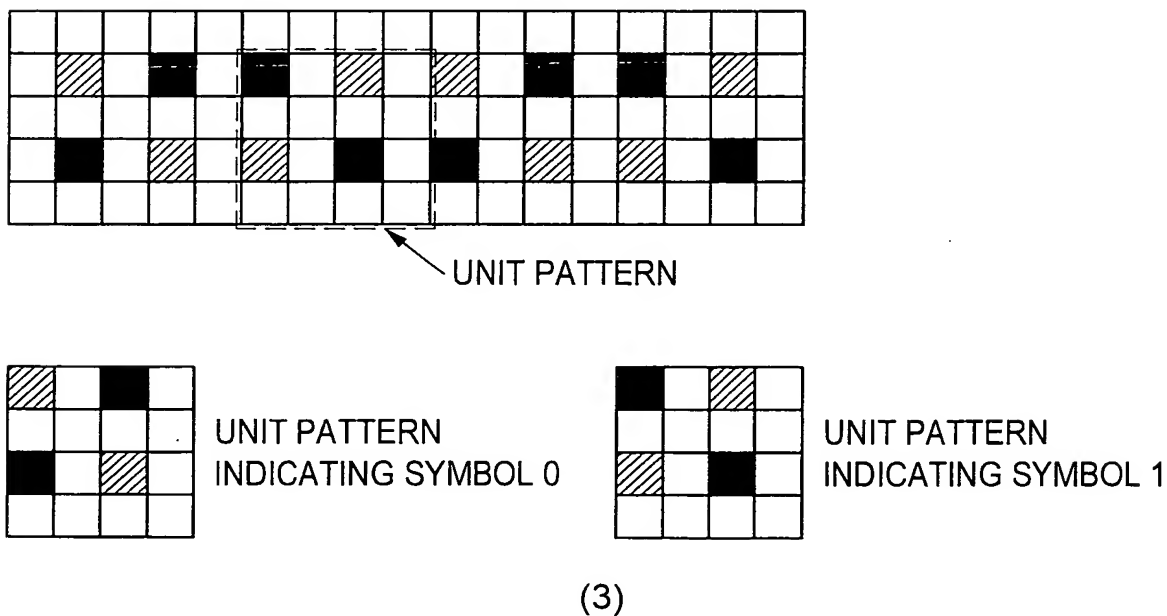
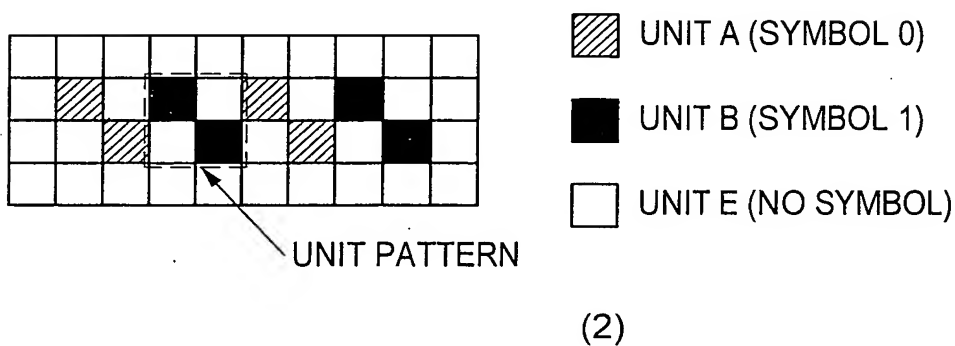
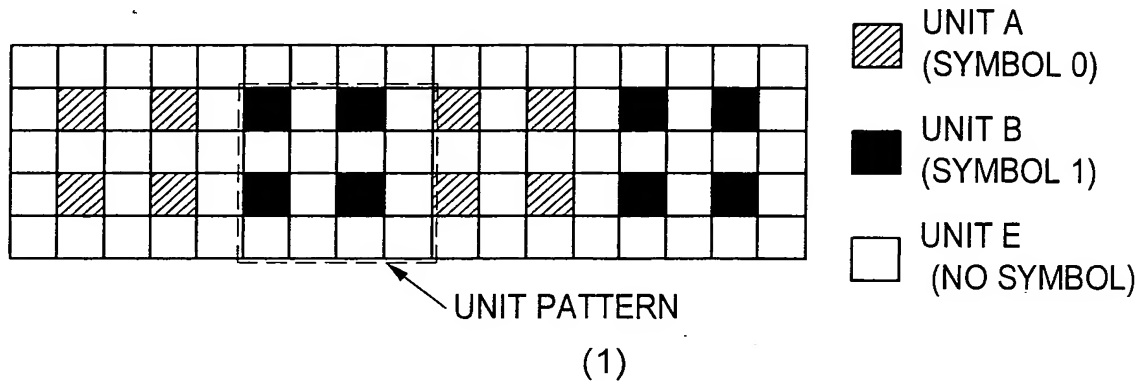


UNIT B

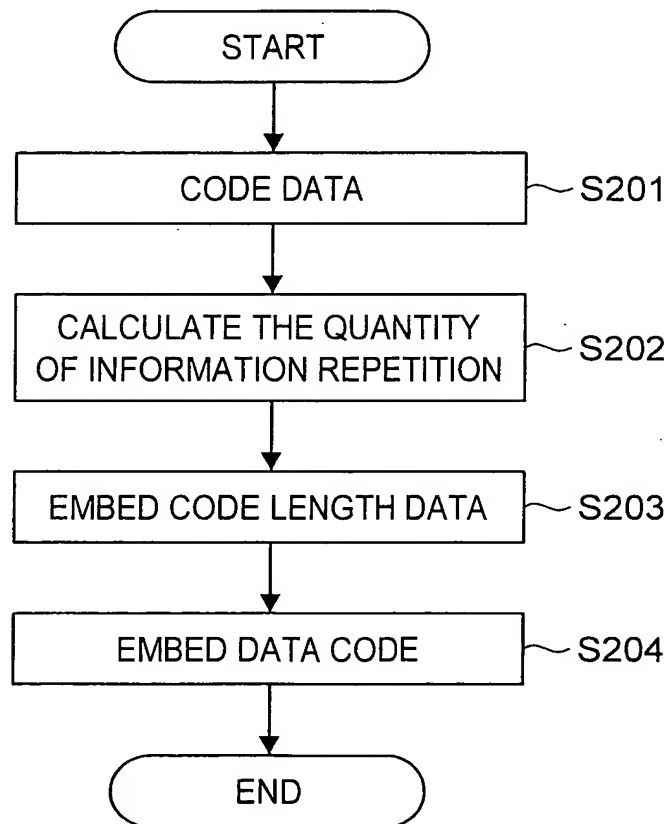
(3)

7/36

**FIG.7**



**FIG.8**

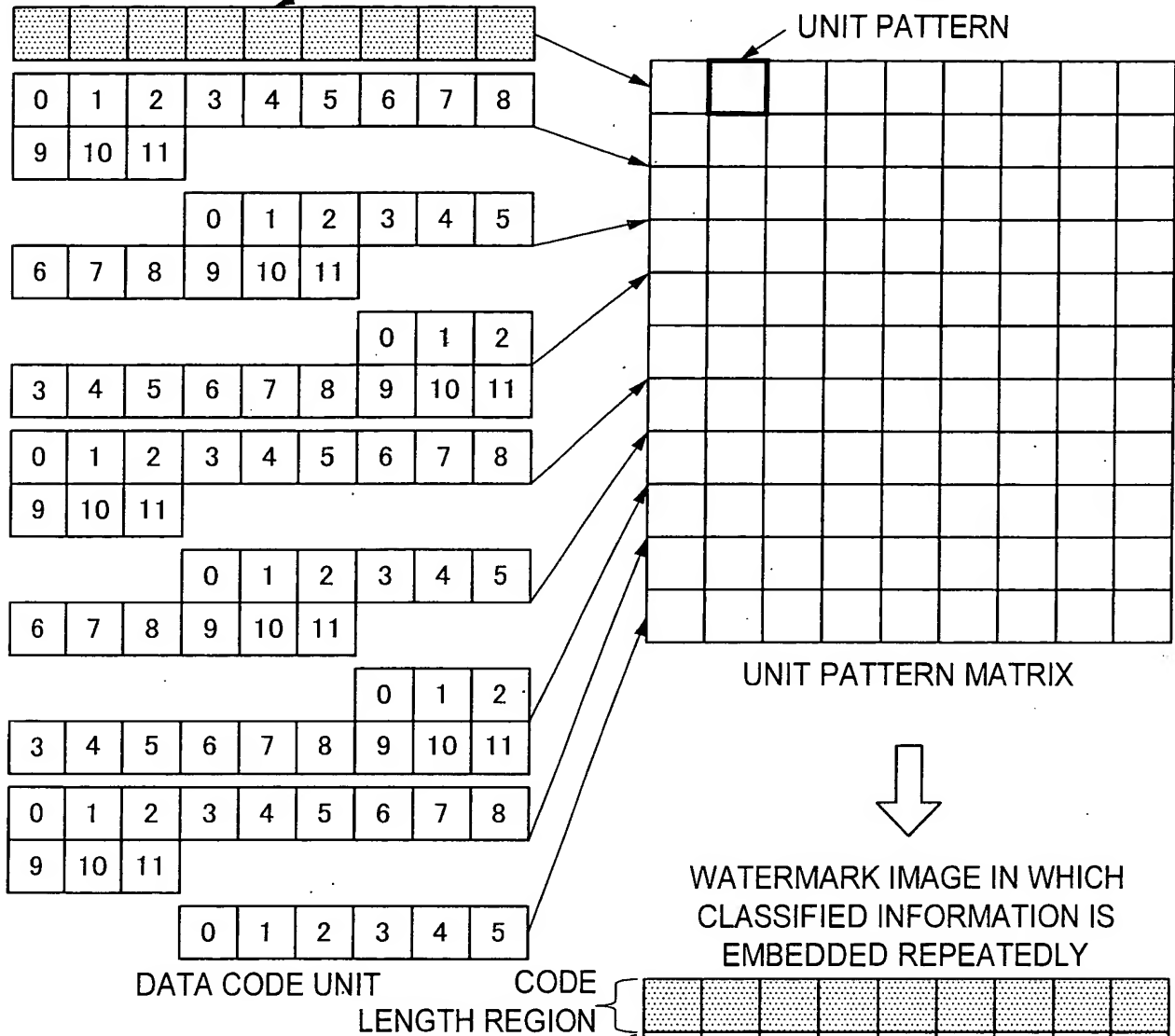




9/36

**FIG.9**

UNIT PATTERN IN WHICH BIT STRING INDICATING CODE LENGTH IS EMBEDDED



INFORMATION REGION

0	1	2	3	4	5	6	7	8
9	10	11	0	1	2	3	4	5
6	7	8	9	10	11	0	1	2
3	4	5	6	7	8	9	10	11
0	1	2	3	4	5	6	7	8
9	10	11	0	1	2	3	4	5
6	7	8	9	10	11	0	1	2
3	4	5	6	7	8	9	10	11
0	1	2	3	4	5	6	7	8
9	10	11	0	1	2	3	4	5

**FIG.10**

SIGNAL UNIT COLOR	COLOR ON INPUT IMAGE	COLOR ON SYNTHESIZED IMAGE
FOREGROUND COLOR	FOREGROUND COLOR	FOREGROUND COLOR OF INPUT IMAGE
FOREGROUND COLOR	BACKGROUND COLOR	FOREGROUND COLOR OF SIGNAL UNIT
BACKGROUND COLOR	FOREGROUND COLOR	FOREGROUND COLOR OF INPUT IMAGE
BACKGROUND COLOR	BACKGROUND COLOR	BACKGROUND COLOR OF INPUT IMAGE

FIG.11

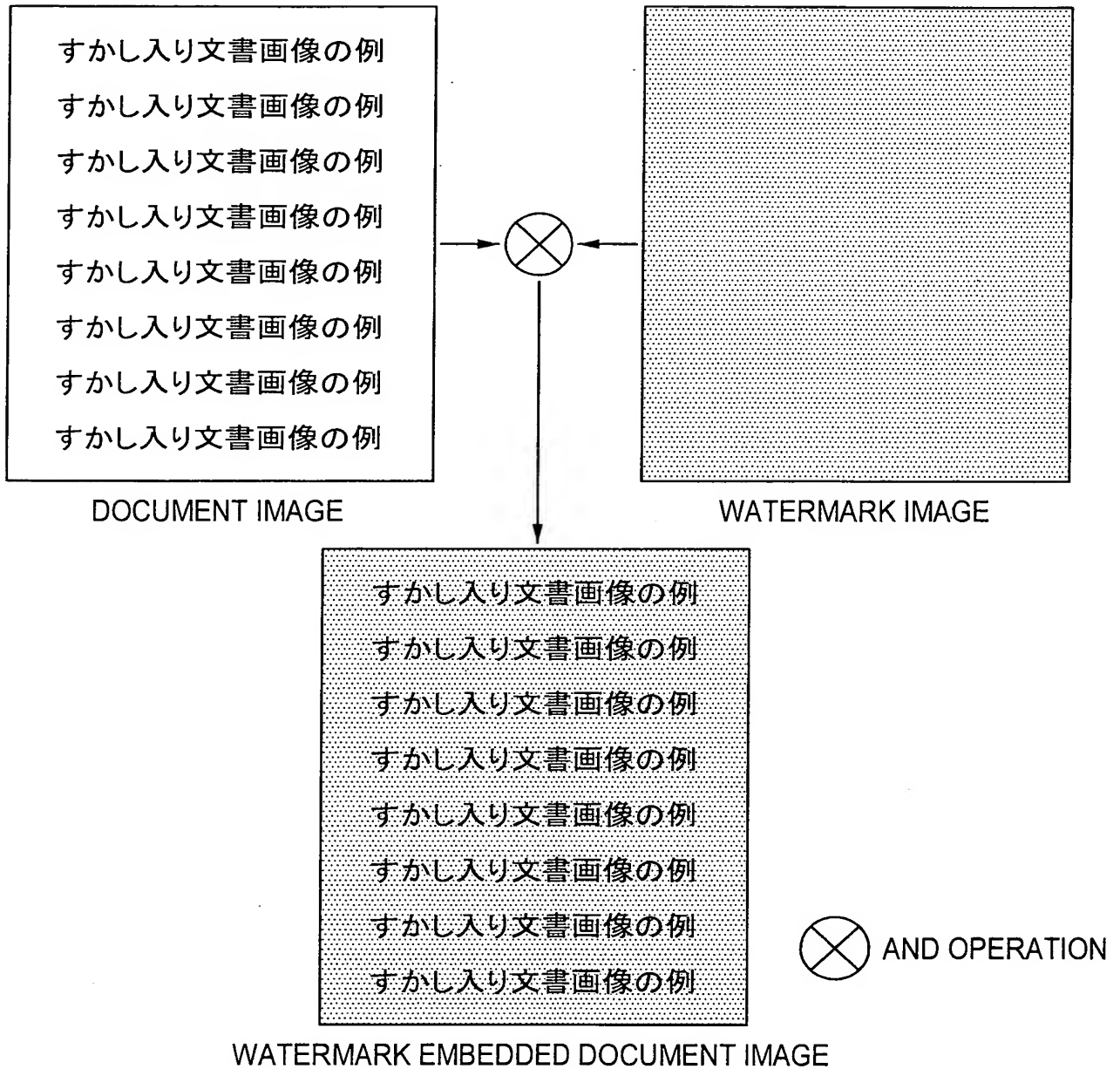
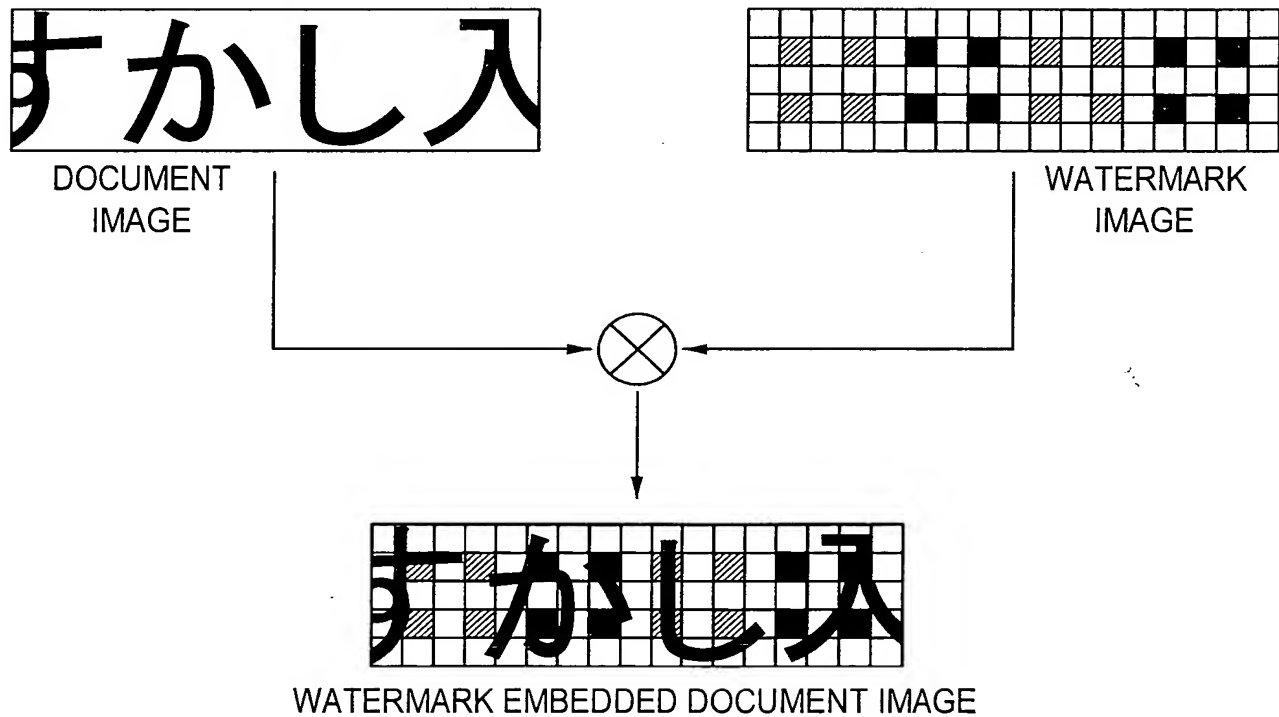
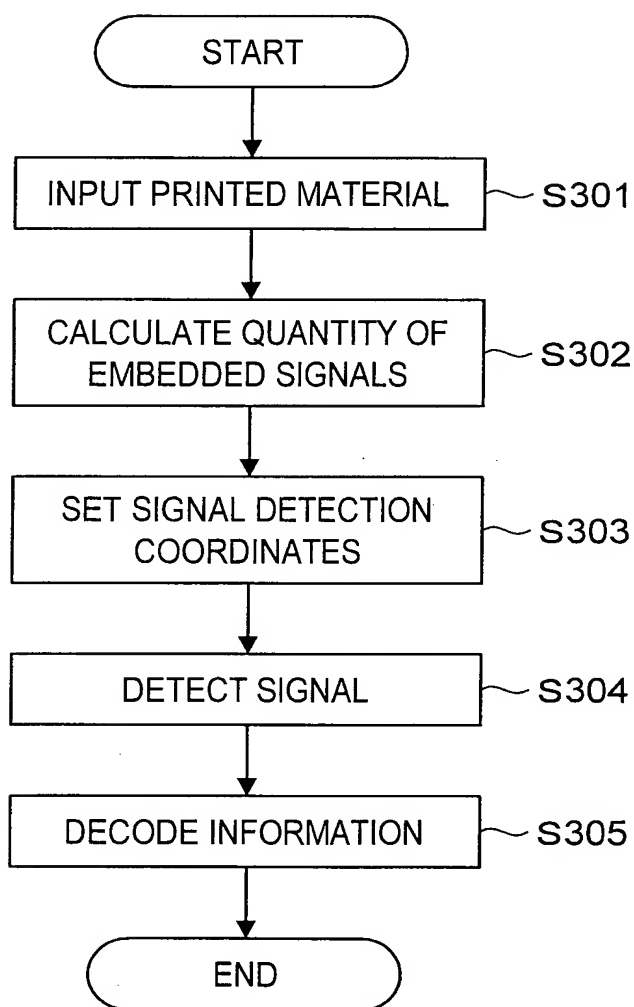


FIG.12



**FIG.13**



14/36

**FIG.14**

すかし入り文書画像の例  
すかし入り文書画像の例  
すかし入り文書画像の例  
すかし入り文書画像の例  
すかし入り文書画像の例  
すかし入り文書画像の例  
すかし入り文書画像の例  
すかし入り文書画像の例

INPUT IMAGE  
(1)

UNIT PATTERN

↓

	す	か	し	入	り	文	書	画	像
	の	例							
	す	か	し	入	り	文	書	画	像
	の	例							
	す	か	し	入	り	文	書	画	像
	の	例							
	す	か	し	入	り	文	書	画	像
	の	例							
	す	か	し	入	り	文	書	画	像
	の	例							
	す	か	し	入	り	文	書	画	像
	の	例							

AFTER SETTING COORDINATE  
(2)

15/36

FIG.15

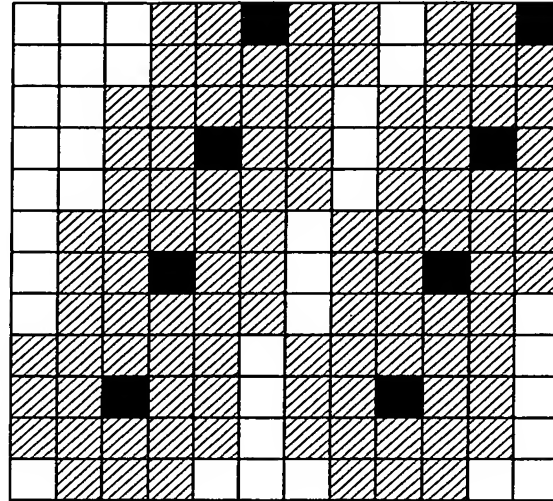
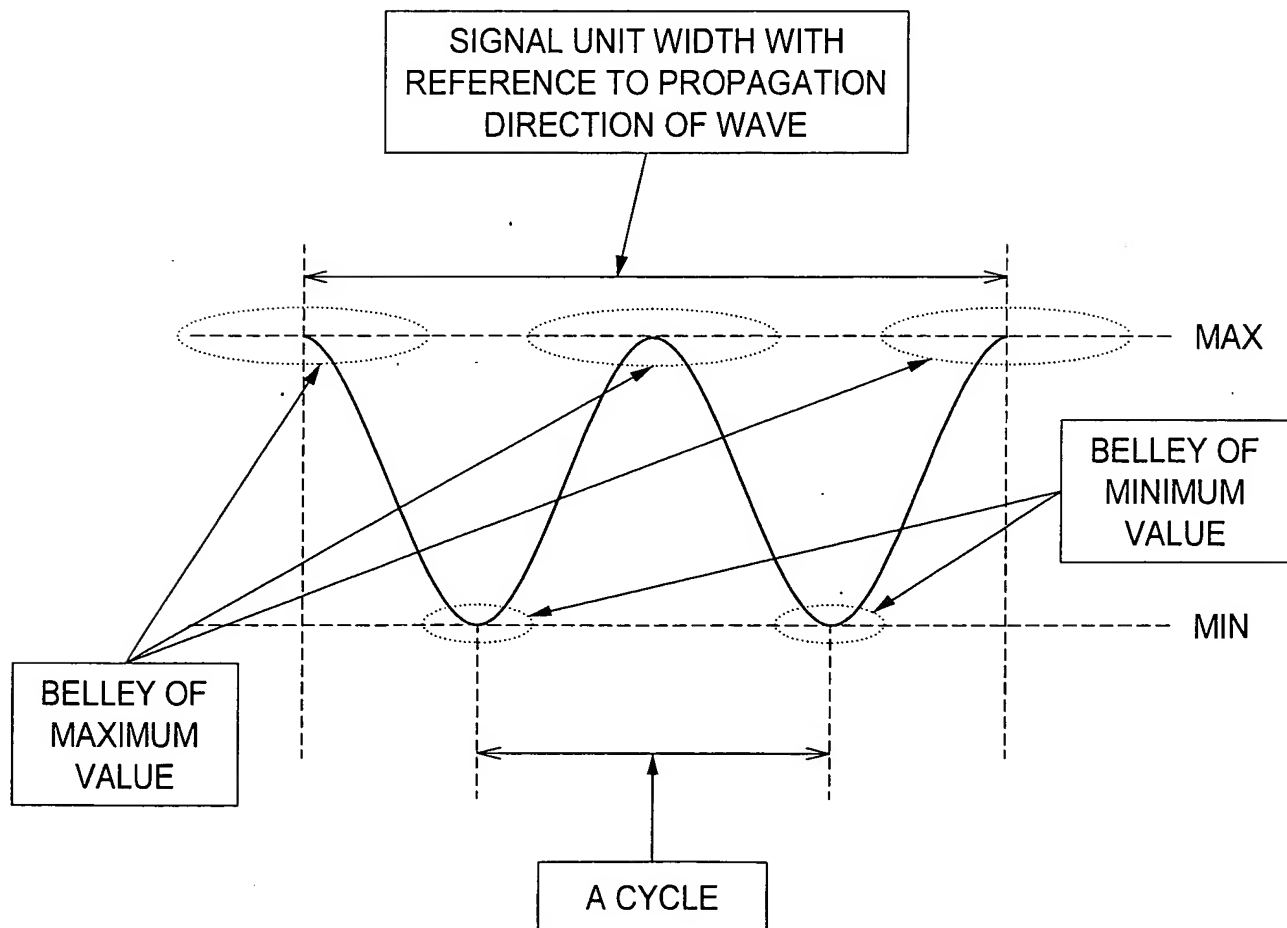
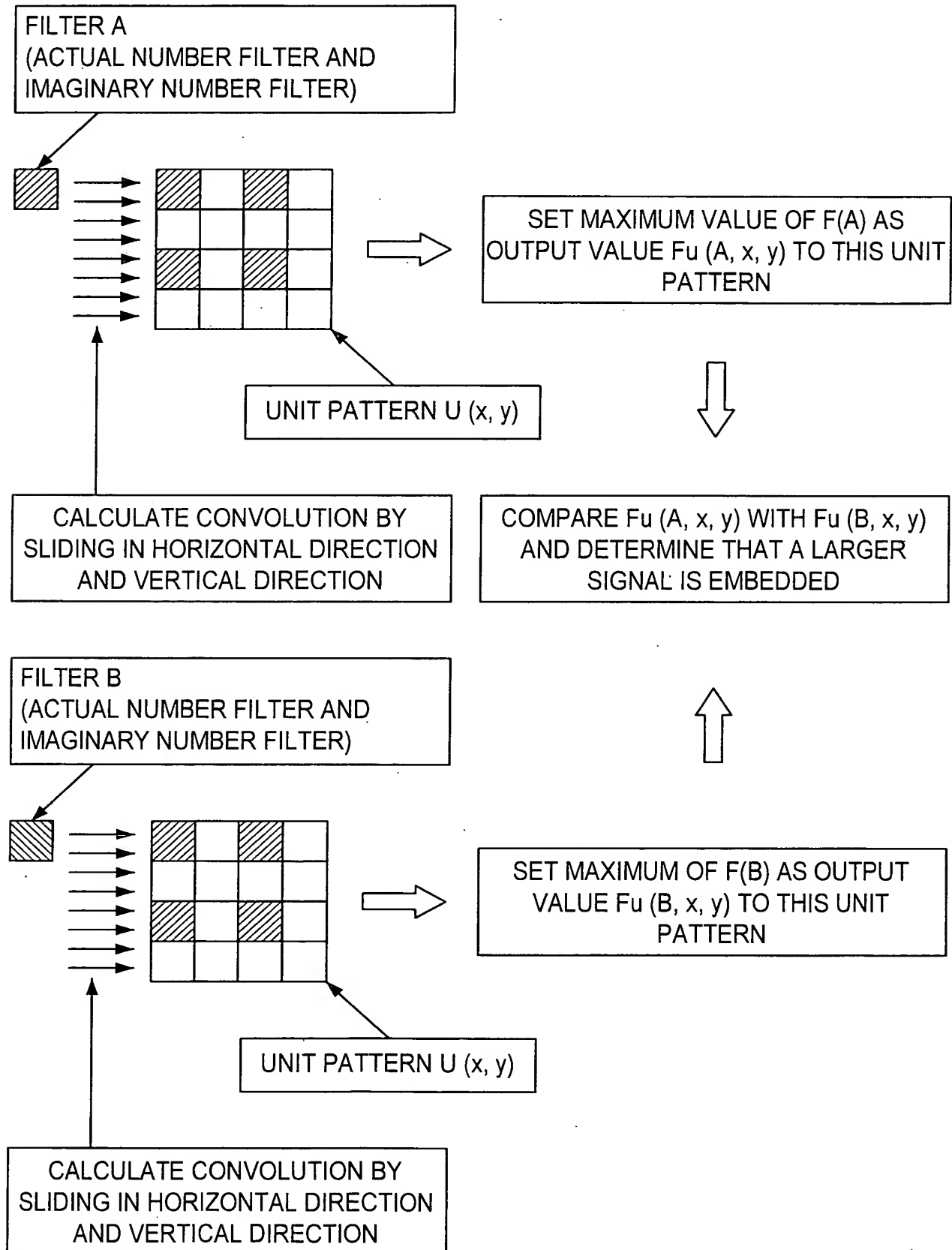


FIG.16



16/36

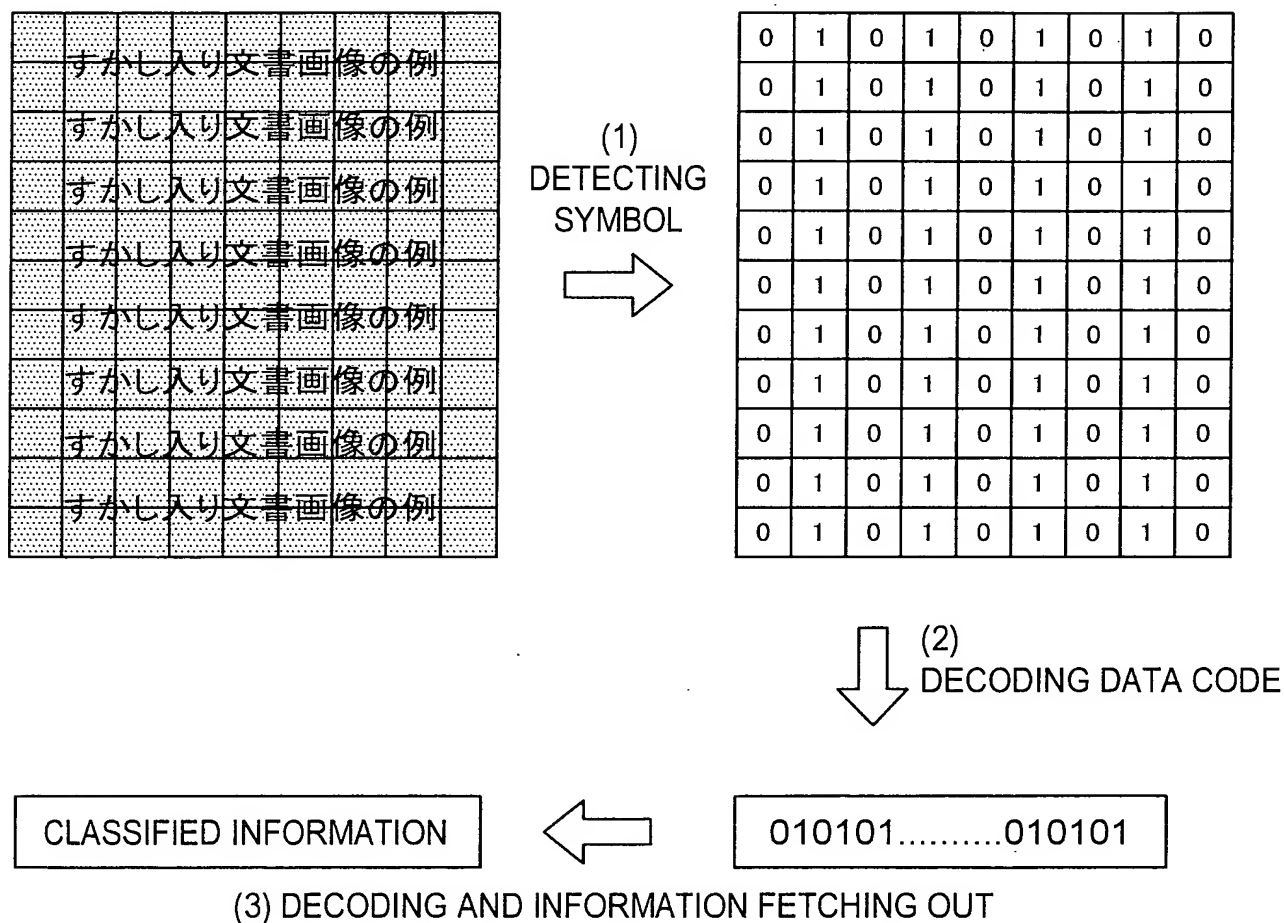
FIG.17



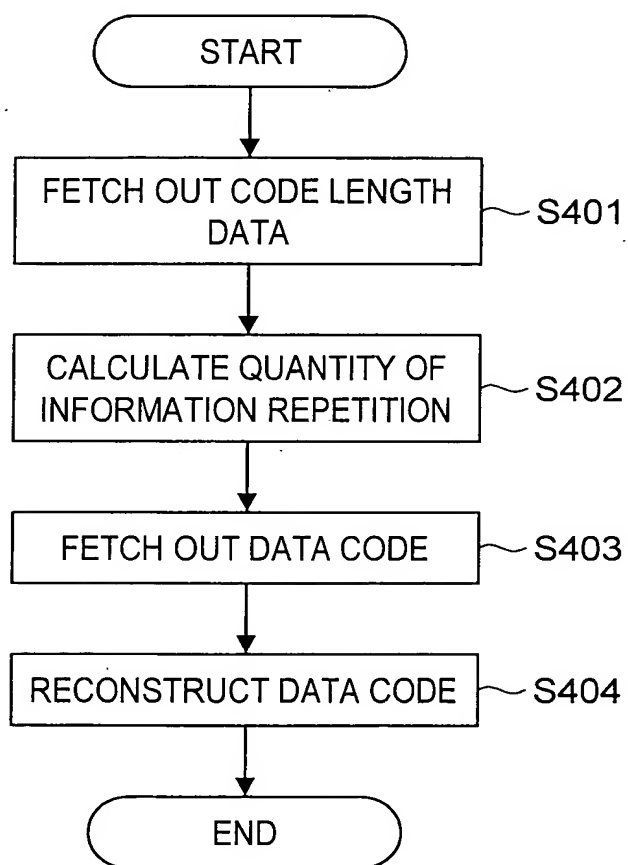


17/36

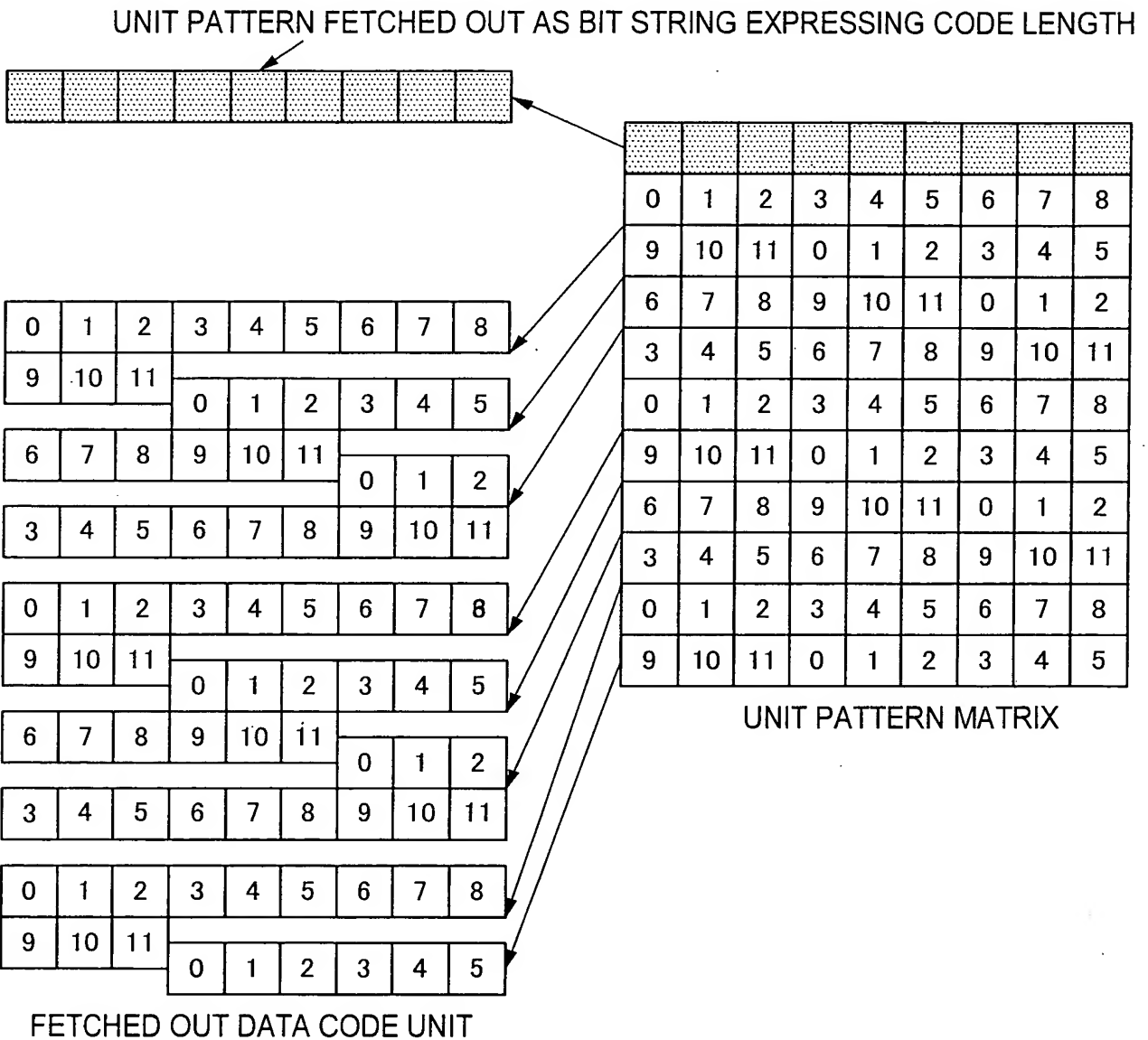
FIG.18



**FIG.19**

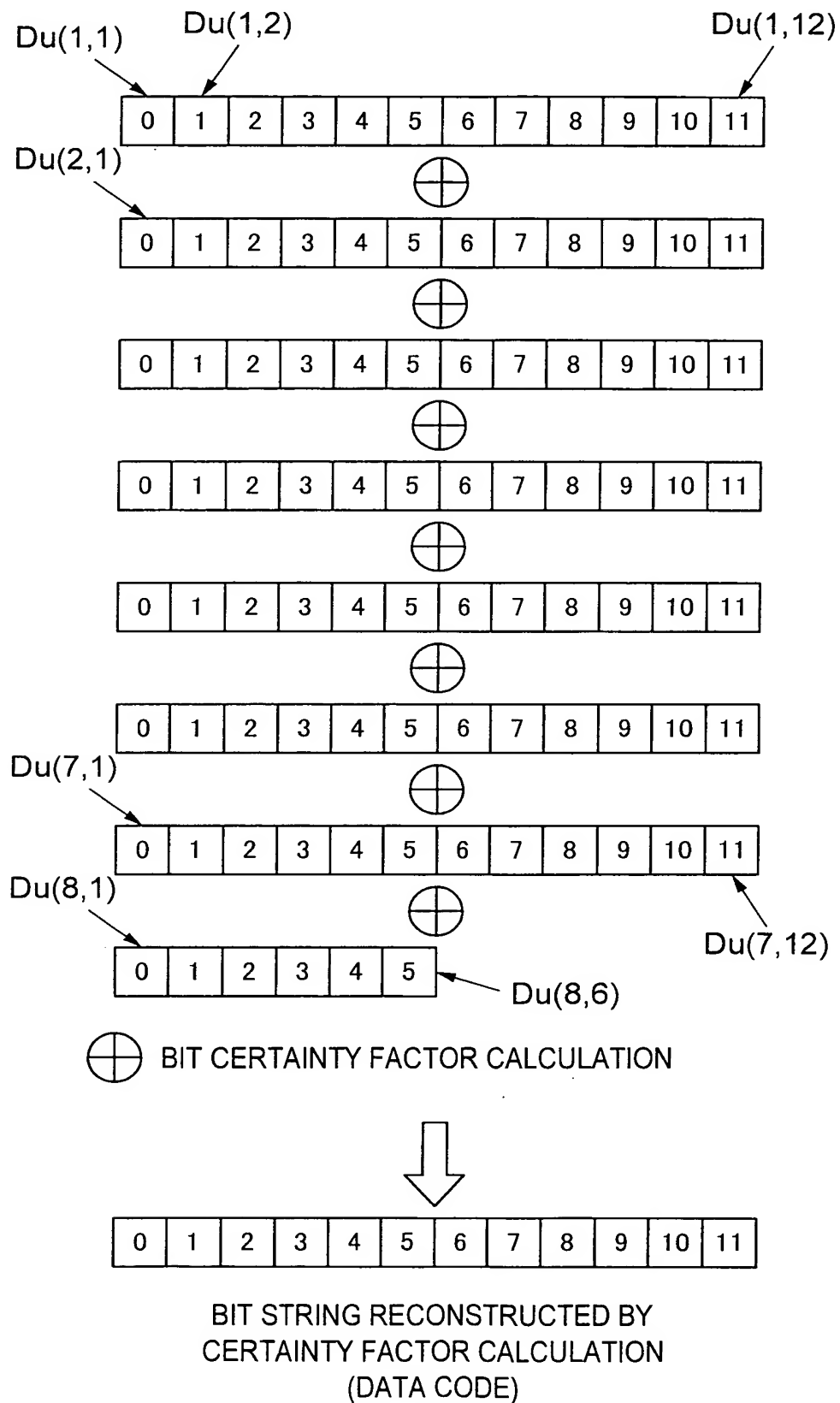


**FIG.20**



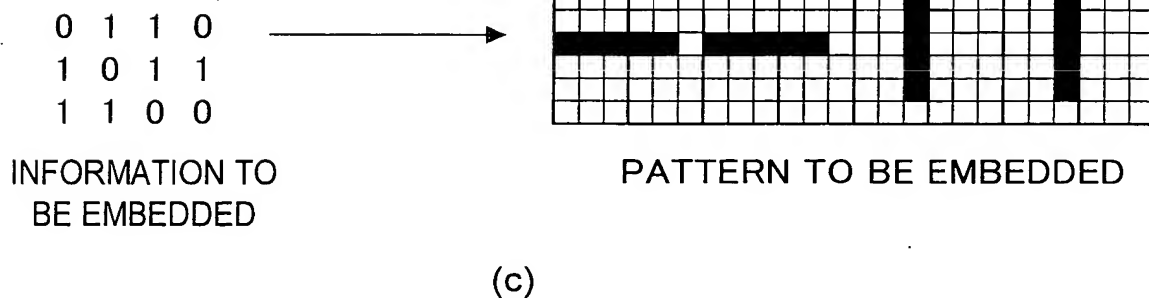
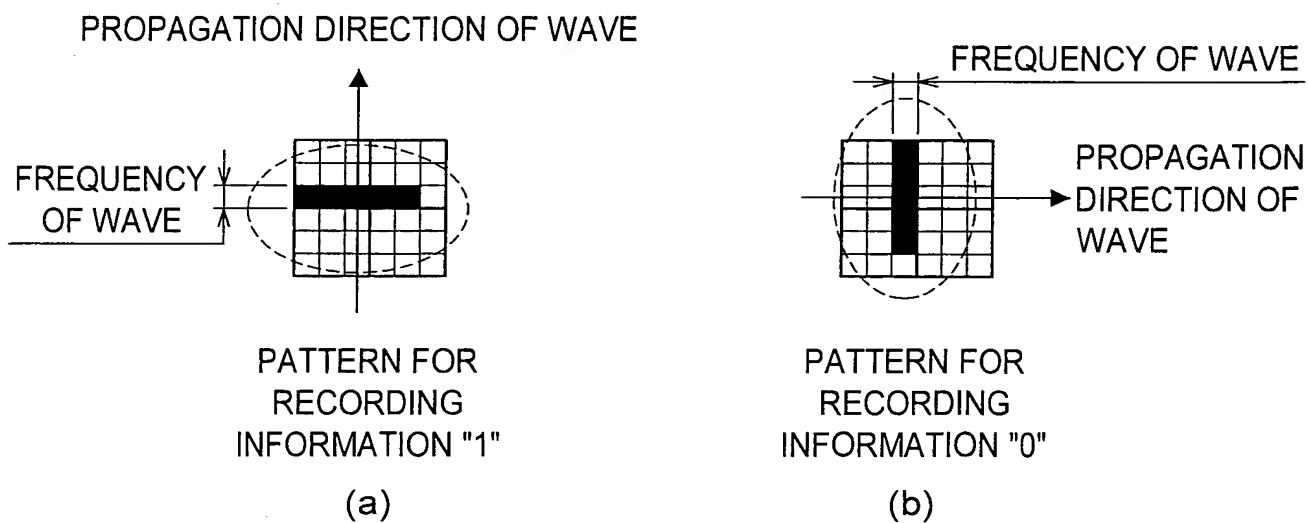
20/36

FIG.21



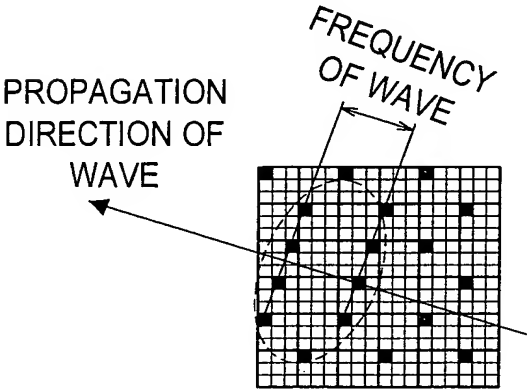
21/36

**FIG.22**



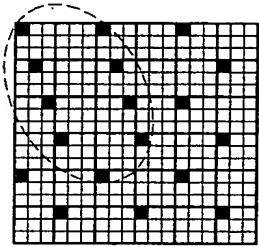
BEST AVAILABLE COPY

FIG.23



PATTERN FOR  
RECORDING  
INFORMATION "1"

(a)

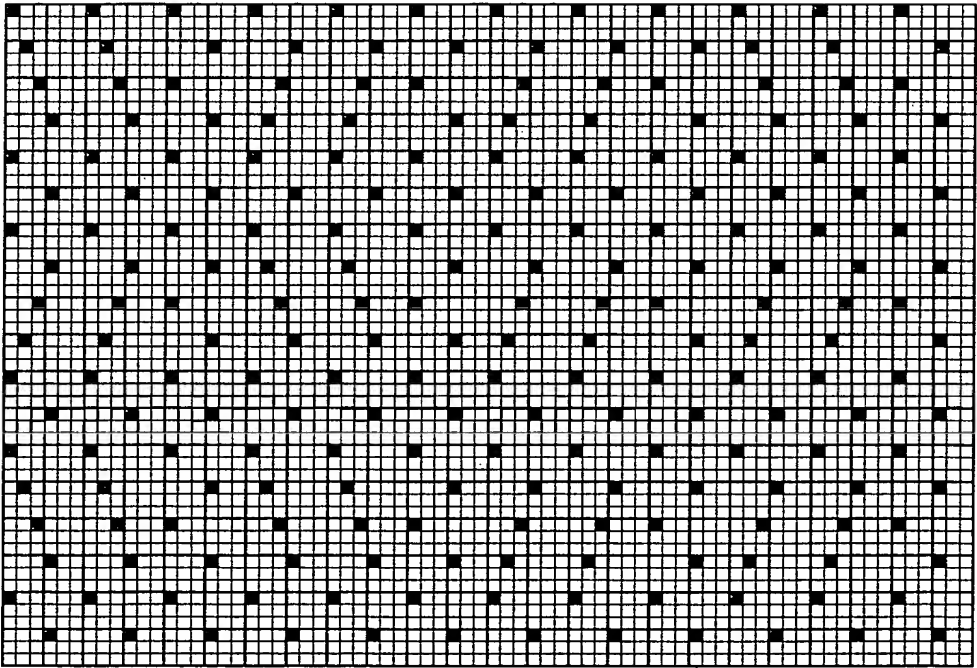


PATTERN FOR  
RECORDING  
INFORMATION "0"

(b)

0 1 1 0  
1 0 1 1  
1 1 0 0

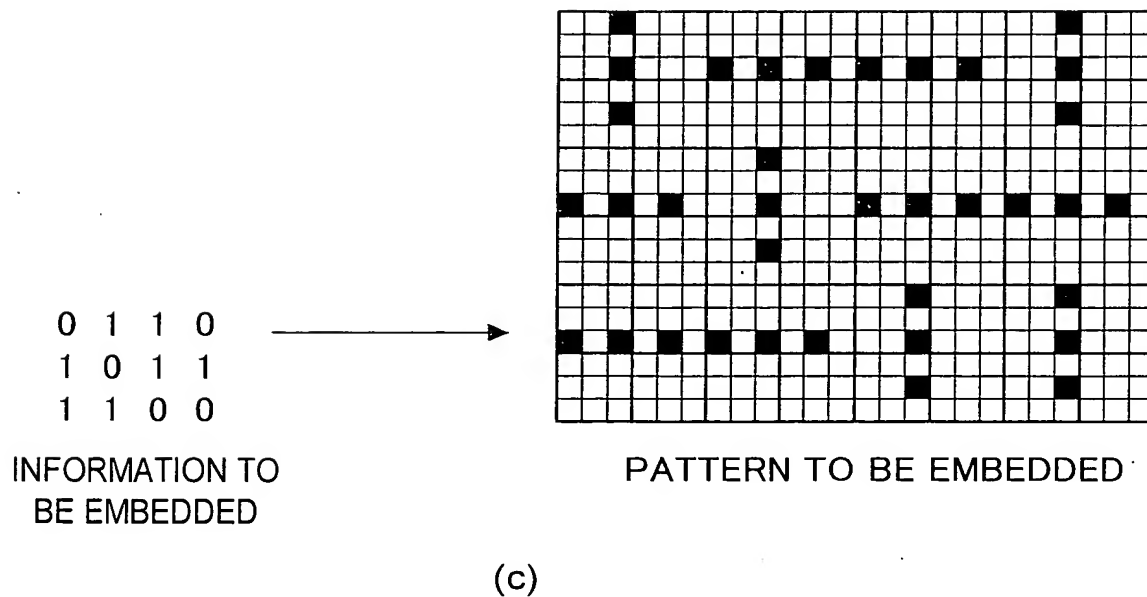
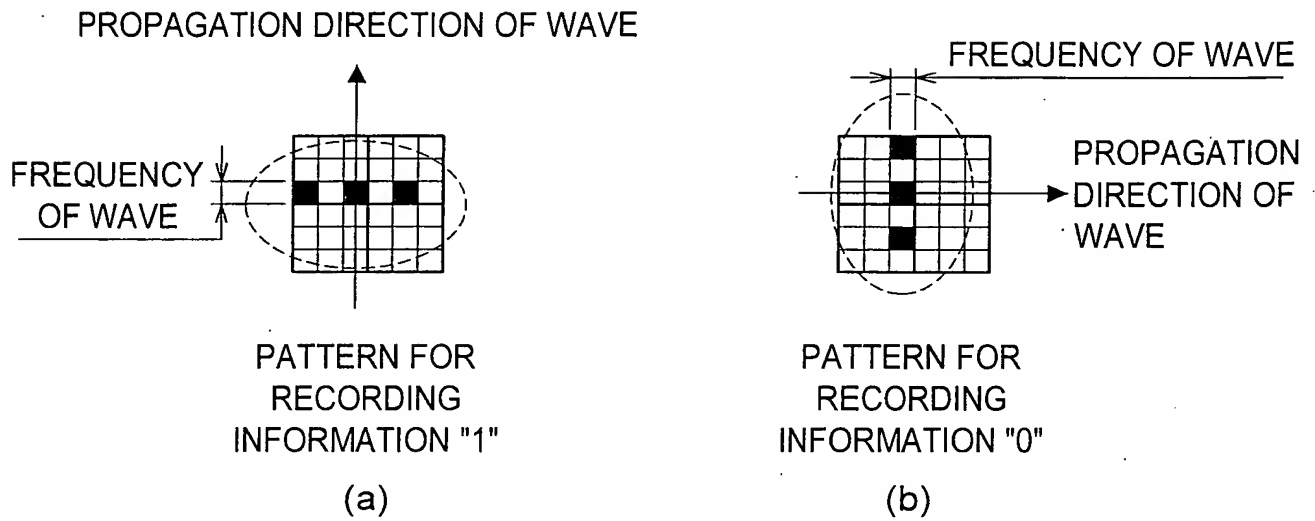
INFORMATION  
TO BE  
EMBEDDED



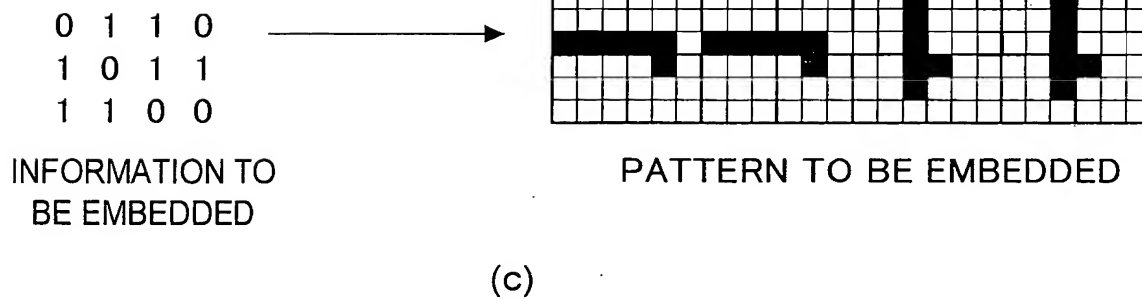
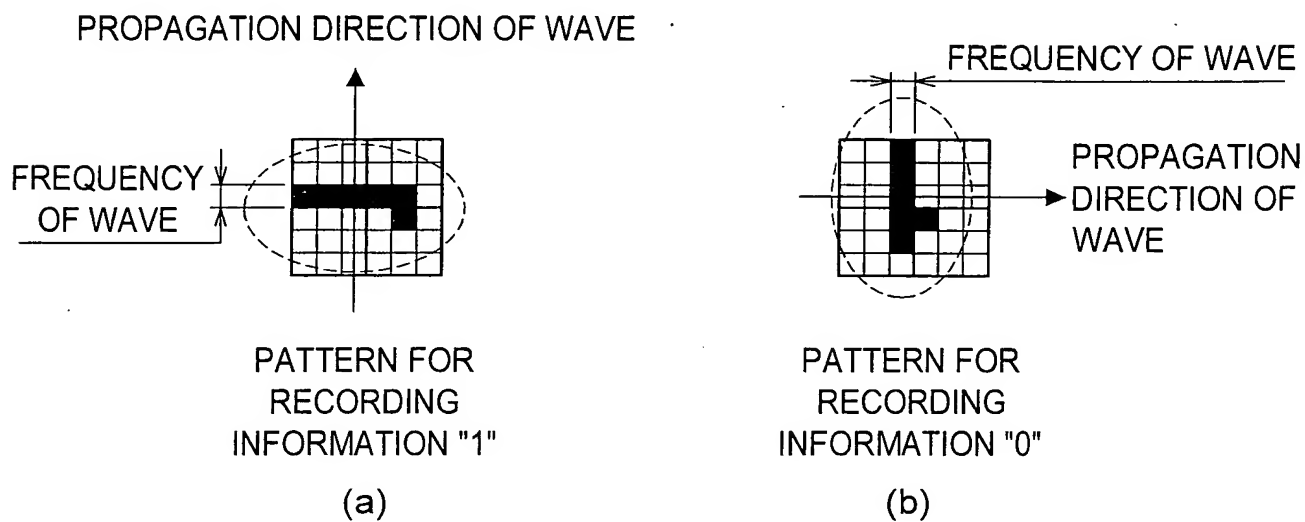
PATTERN TO BE EMBEDDED

(c)

**FIG.24**



**FIG.25**



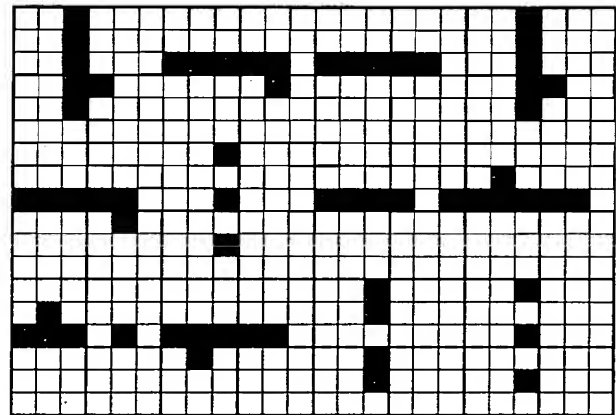


**FIG.26**

PATTERN CHANGE-OVER  
INFORMATION  
(OR RANDOM NUMBER)

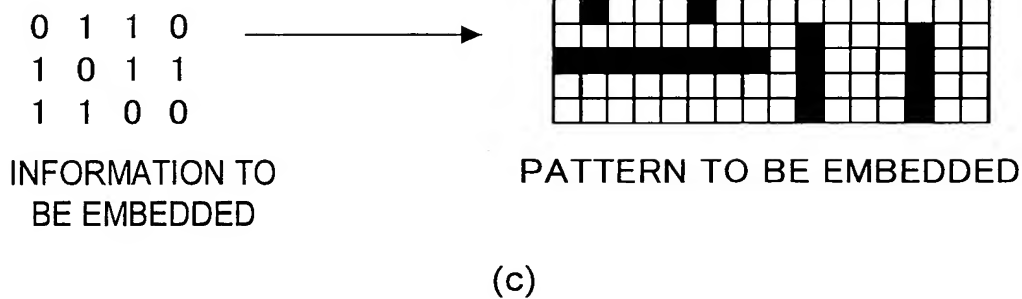
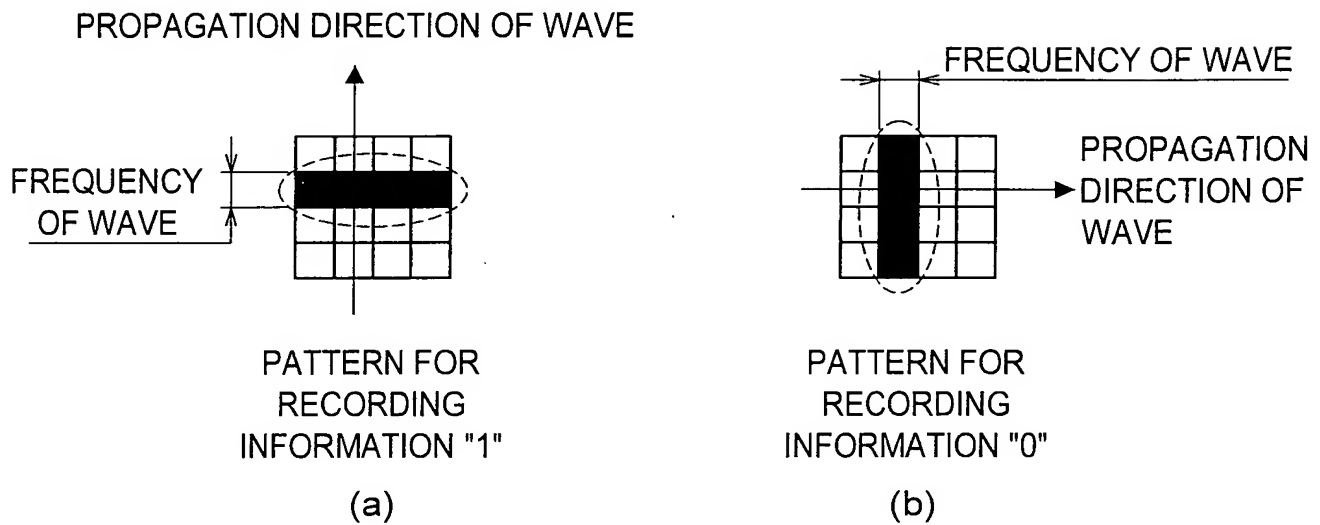
0 1 1 0  
1 0 1 1  
1 1 0 0

INFORMATION TO  
BE EMBEDDED



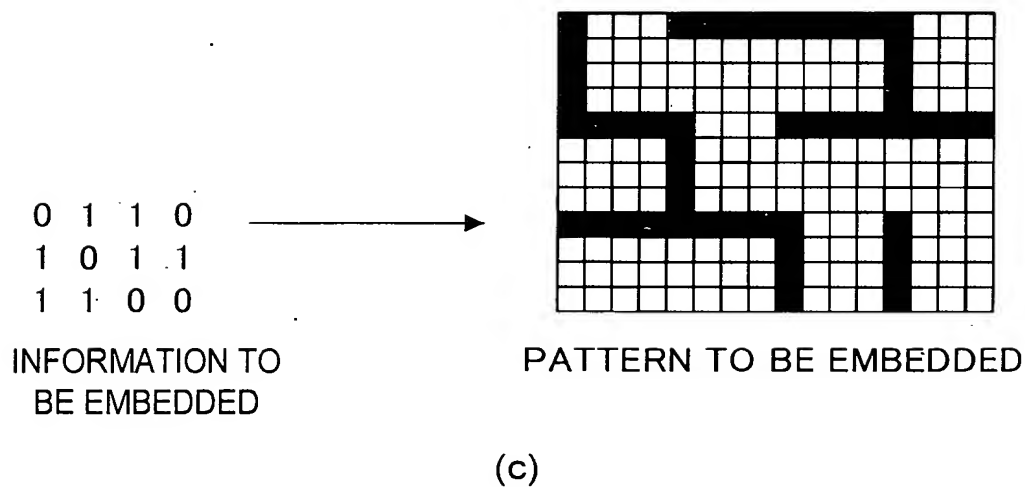
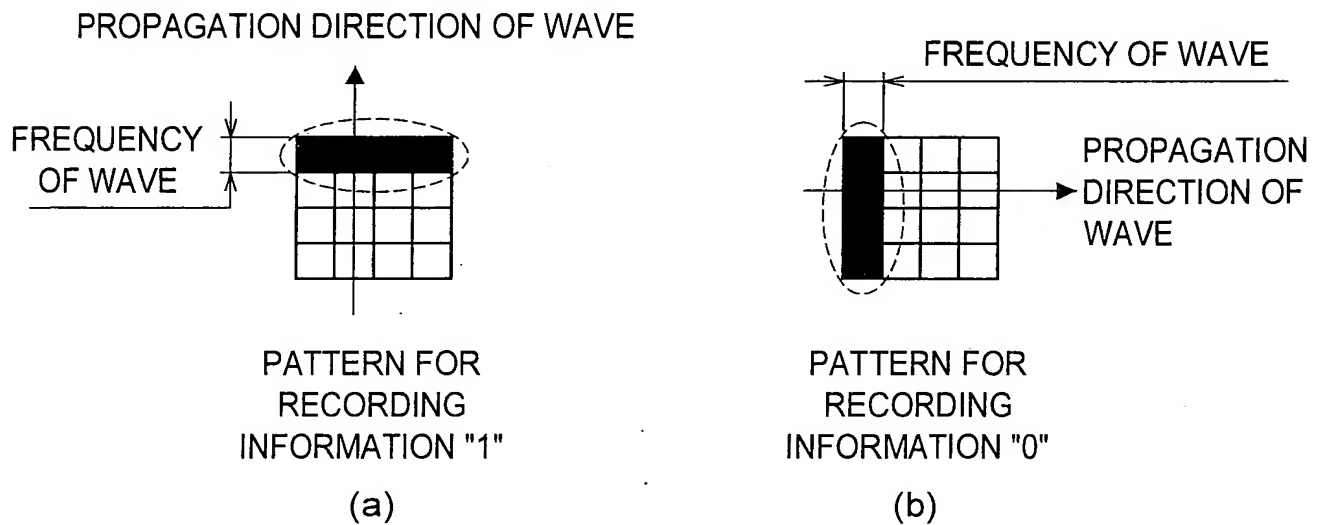
PATTERN TO BE EMBEDDED

**FIG.27**



27/36

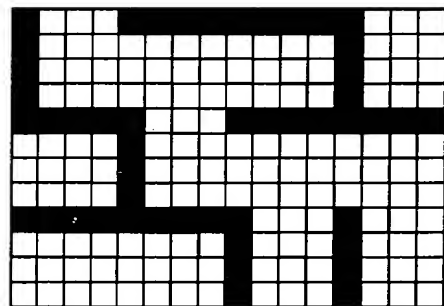
**FIG.28**



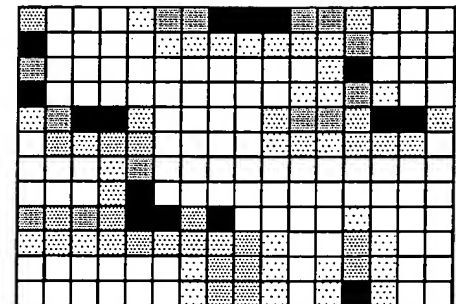
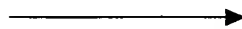
BEST AVAILABLE COPY

28/36

**FIG.29**



PATTERN TO BE EMBEDDED



PATTERN OBTAINED BY  
PRINTING/SCANNING

**FIG.30**

$P_{0,0}$	$P_{1,0}$	$P_{2,0}$	$P_{3,0}$
$P_{0,1}$	$P_{1,1}$	$P_{2,1}$	$P_{3,1}$
$P_{0,2}$	$P_{1,2}$	$P_{2,2}$	$P_{3,2}$
$P_{0,3}$	$P_{1,3}$	$P_{2,3}$	$P_{3,3}$

FILTER  
PROCESSING MASK

(a)

$P_{0,0}$	$P_{1,0}$	$P_{2,0}$	$P_{3,0}$
$P_{0,1}$	$P_{1,1}$	$P_{2,1}$	$P_{3,1}$
$P_{0,2}$	$P_{1,2}$	$P_{2,2}$	$P_{3,2}$
$P_{0,3}$	$P_{1,3}$	$P_{2,3}$	$P_{3,3}$

PATTERN IN WHICH  
FILTER OUTPUT IS  
POSITIVE

(b)

$P_{0,0}$	$P_{1,0}$	$P_{2,0}$	$P_{3,0}$
$P_{0,1}$	$P_{1,1}$	$P_{2,1}$	$P_{3,1}$
$P_{0,2}$	$P_{1,2}$	$P_{2,2}$	$P_{3,2}$
$P_{0,3}$	$P_{1,3}$	$P_{2,3}$	$P_{3,3}$

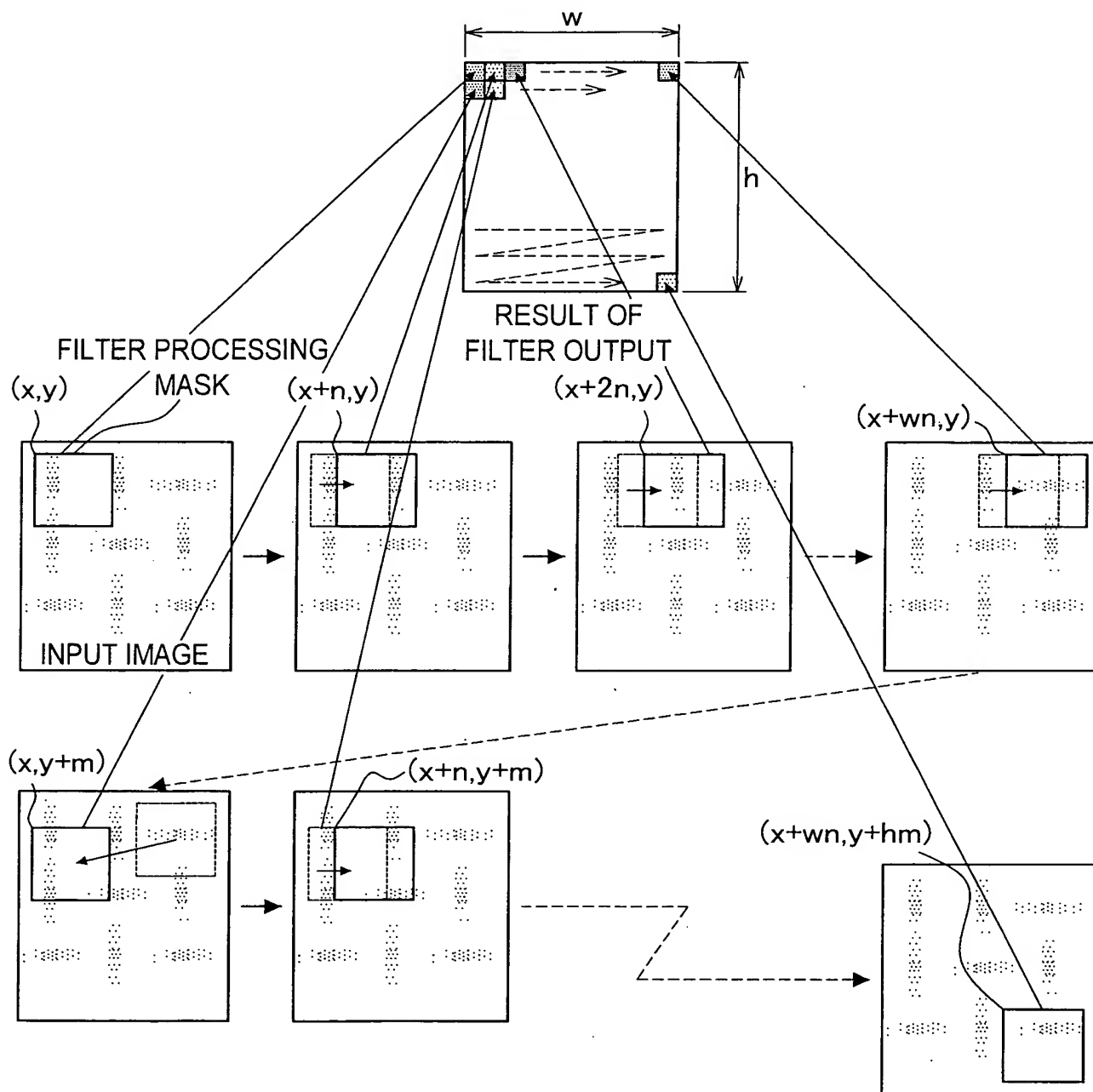
PATTERN IN WHICH  
FILTER OUTPUT IS  
NEGATIVE

(c)

BEST AVAILABLE COPY

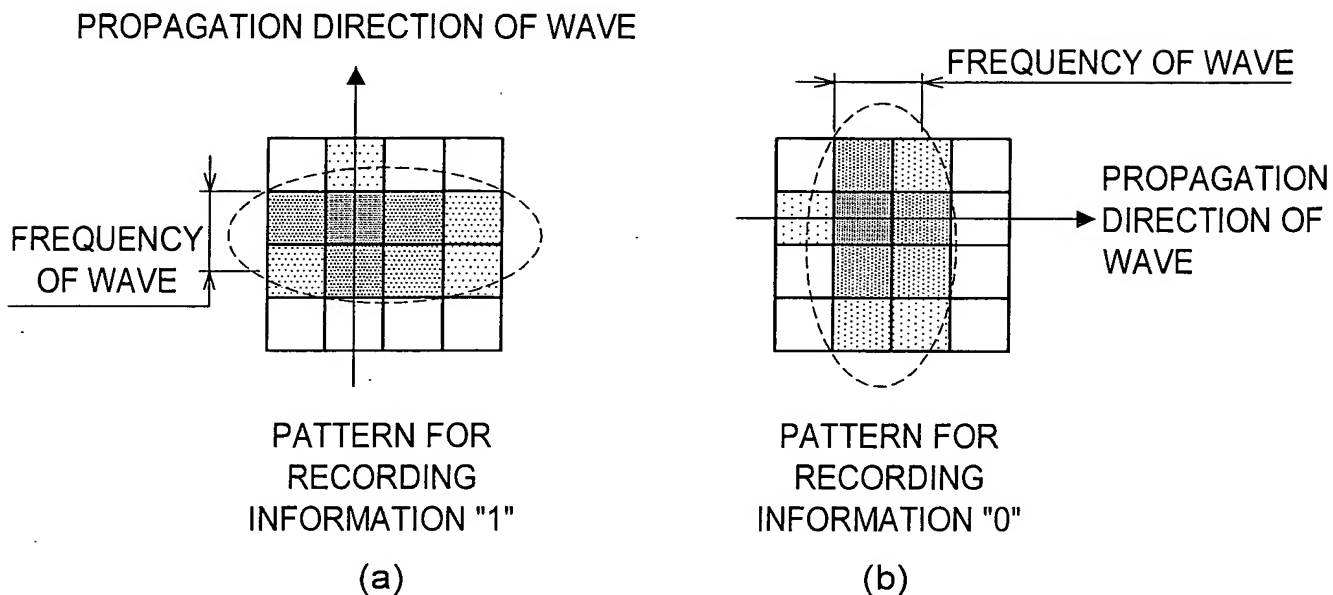
29/36

FIG.31

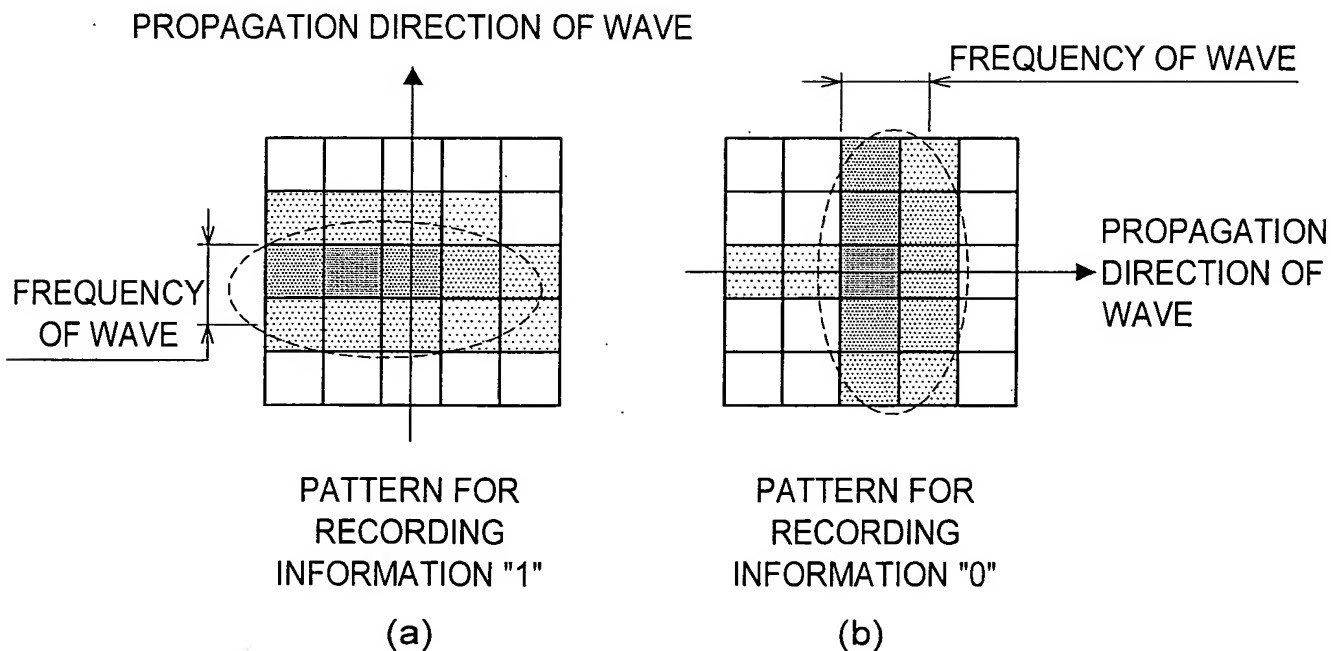


BEST AVAILABLE COPY

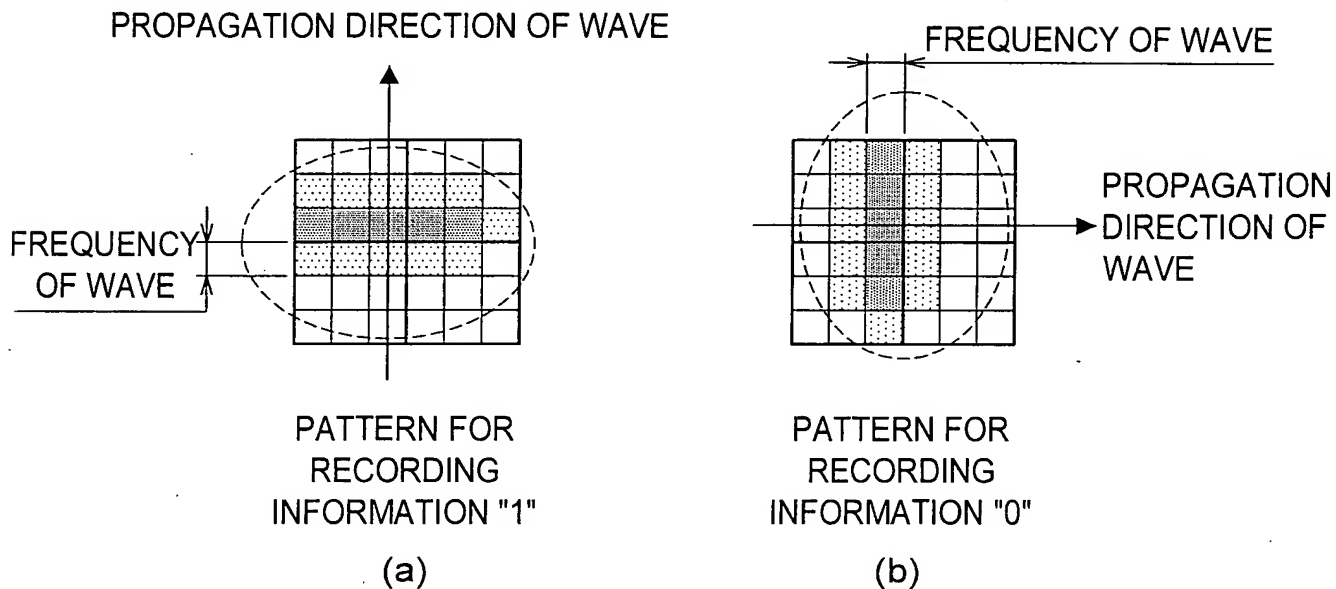
**FIG.32**



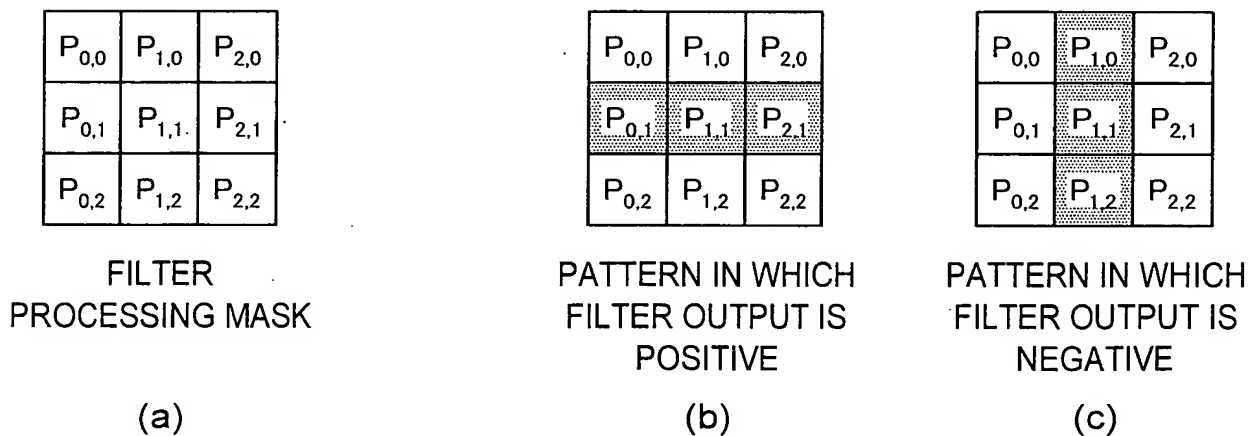
**FIG.33**



**FIG.34**

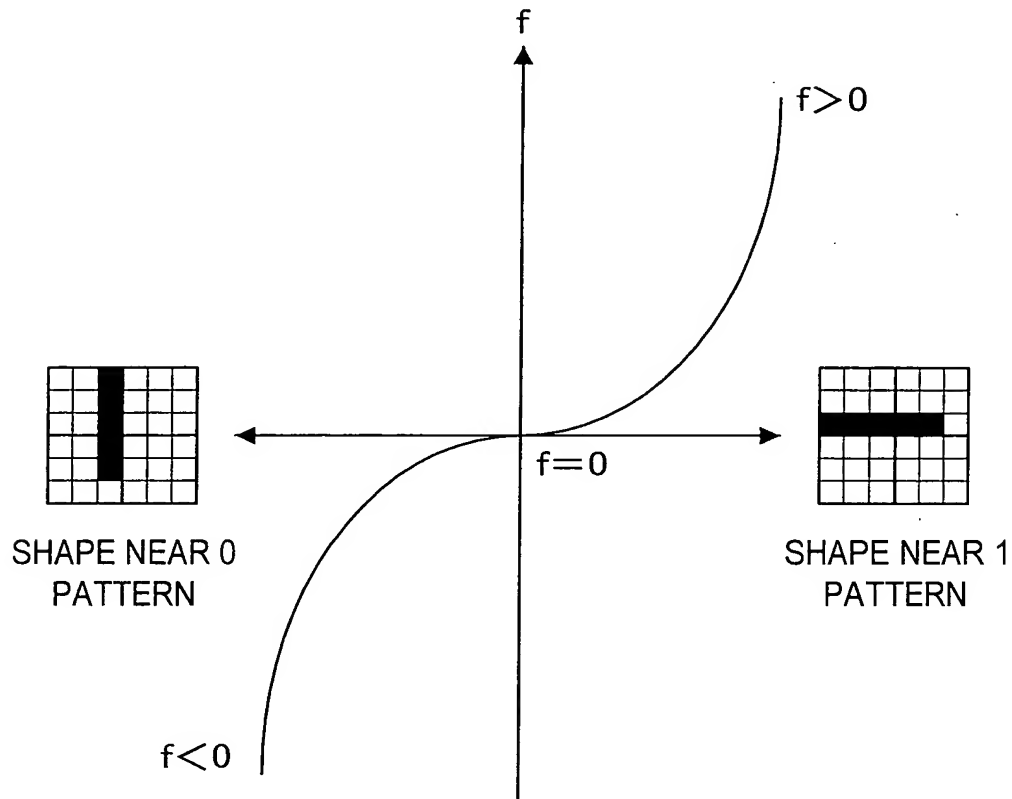


**FIG.35**



32/36

FIG.36



BEST AVAILABLE COPY



33/36

FIG.37

P <sub>0,0</sub>	P <sub>1,0</sub>	P <sub>2,0</sub>	P <sub>3,0</sub>	P <sub>4,0</sub>	P <sub>5,0</sub>
P <sub>0,1</sub>	P <sub>1,1</sub>	P <sub>2,1</sub>	P <sub>3,1</sub>	P <sub>4,1</sub>	P <sub>5,1</sub>
P <sub>0,2</sub>	P <sub>1,2</sub>	P <sub>2,2</sub>	P <sub>3,2</sub>	P <sub>4,2</sub>	P <sub>5,2</sub>
P <sub>0,3</sub>	P <sub>1,3</sub>	P <sub>2,3</sub>	P <sub>3,3</sub>	P <sub>4,3</sub>	P <sub>5,3</sub>
P <sub>0,4</sub>	P <sub>1,4</sub>	P <sub>2,4</sub>	P <sub>3,4</sub>	P <sub>4,4</sub>	P <sub>5,4</sub>
P <sub>0,5</sub>	P <sub>1,5</sub>	P <sub>2,5</sub>	P <sub>3,5</sub>	P <sub>4,5</sub>	P <sub>5,5</sub>

FILTER  
PROCESSING MASK

(a)


PATTERN IN WHICH FILTER  
PROCESSING RESULT IS  
POSITIVE

(b)

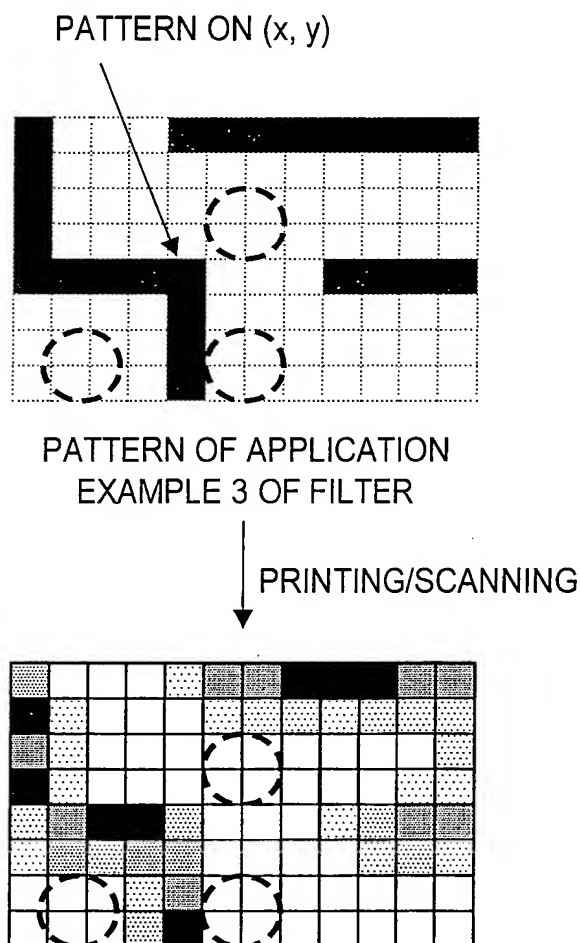

PATTERN IN WHICH FILTER  
PROCESSING RESULT IS  
NEGATIVE

(c)

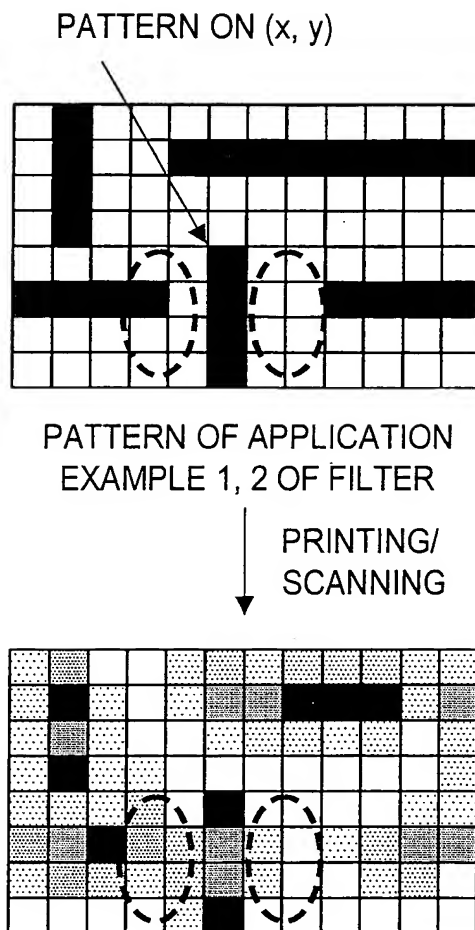


PORTION NOT INCLUDED IN FILTER PROCESSING OPERATION

FIG.38



(a)

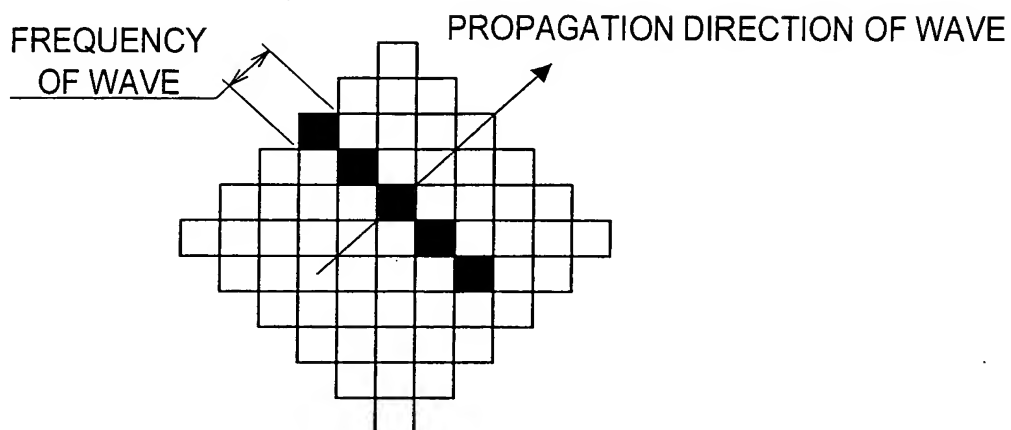


PORTION TO BE READ IN  
BY FILTER PROCESSING

(b)

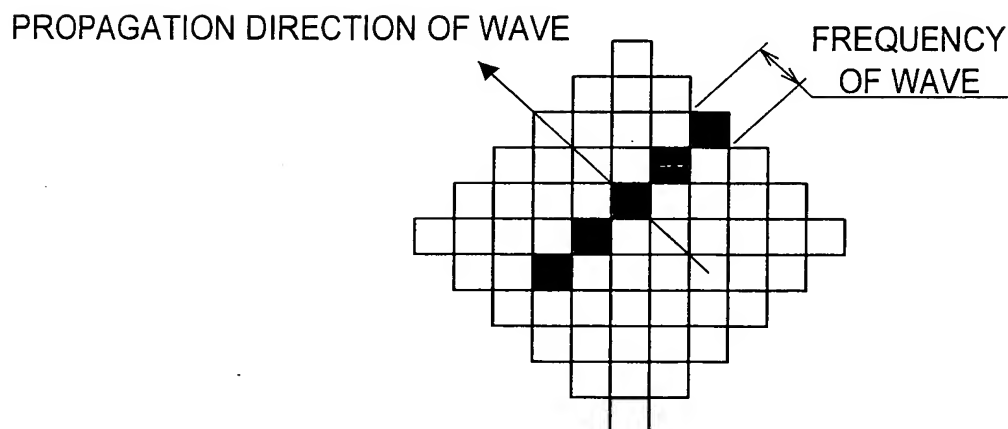
35/36

**FIG.39**



PATTERN FOR  
RECORDING  
INFORMATION "1"

(a)



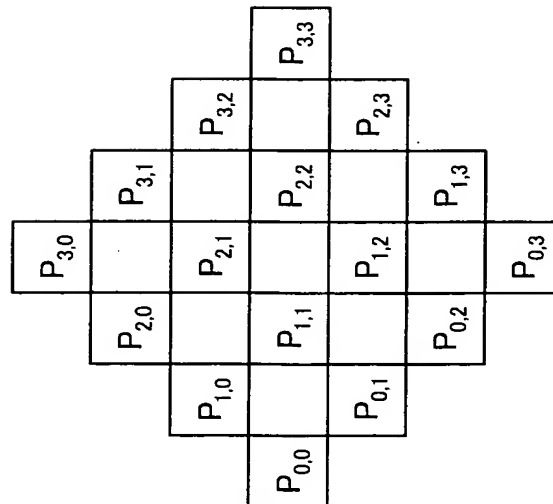
PATTERN FOR  
RECORDING  
INFORMATION "0"

(b)

BEST AVAILABLE COPY

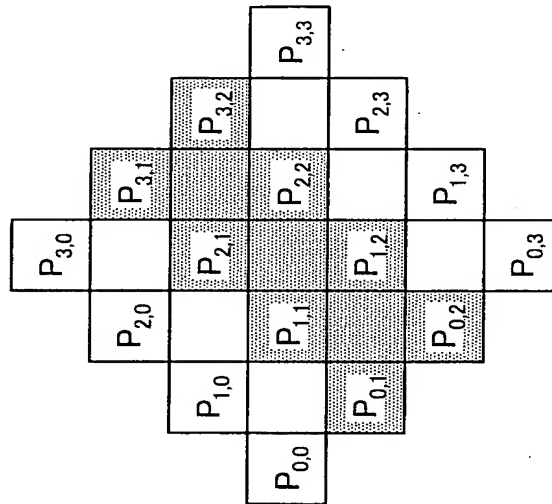
36/36

**FIG.40**



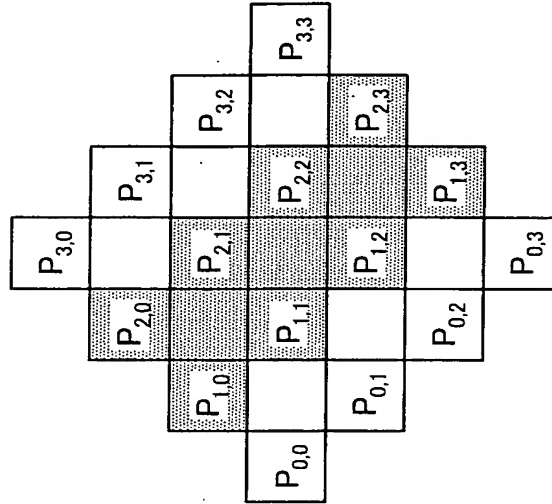
FILTER PROCESSING MASK  
 (CASE OF SCANNING 600 dpi  
 PRINTED MATERIAL AT 400 dpi)

(a)



PATTERN IN WHICH FILTER  
 OUTPUT IS POSITIVE

(b)



PATTERN IN WHICH FILTER  
 OUTPUT IS NEGATIVE

(c)